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REPUBLICAN America and Americans are not to have any monopoly of deeds of "royal" munificence. The Duc D'AUMALE has just made a gift to the Institute of France, in trust for the French nation, of his magnificent Chantilly estates, with all their priceless treasures of art and literature. The estate is said to be valued at 60,000,000 francs, or *twelve million dollars*, and this act of royal liberality is probably unparalleled in history.

This is the certified extract from the will:

"Wishing to preserve for France the domain of Chantilly, with its forests, its lawns, its waters, its buildings and all they contain, including trophies, pictures, books, archives, and objects of art, I have resolved to intrust its deposit to the illustrious body that did me the honor to call me within its ranks. Consequently give and bequeath to the French Institute, to be held according to the conditions herein specified, the domain of Chantilly, just as it shall be at the day of my death, the legatee to maintain the domain in its then state. After having defrayed the expenses of keeping it up, the Institute will employ the excess of revenue from the estate—first, in acquiring objects of art; secondly, in pensions and pecuniary aid to literary men and artists; thirdly, in establishing a fund to aid and encourage those who devote themselves to the career of letters, science, or art. The galleries and collections at Chantilly will be called the Musée Condé, and shall be open to the public."

As the New York *Herald*, from which we take this announcement, truly says:

"There are kings in art, kings in science, kings in literature, but greatest of all, surely, are the monarchs in good deeds, and it is such deeds as these that have placed the Duc d'Aumale on perhaps the grandest throne of all within the gift of the people of France."

THE great revival in business that has fairly taken root in this country has a more healthy tone and better prospect for enduring than the spurt we had a year ago. At that time, as we pointed out, every branch of business was lifeless throughout Europe, and so closely connected are countries to-day that no one can long enjoy great prosperity while the others are suffering from business stagnation. Our present active business is accompanied with a decided improvement and a better outlook in every European country. There is, consequently, good ground for the belief that we have fully entered upon a great wave of universal prosperity that will carry us forward for a few years at least.

We are not admirers of "booming," and we hope the present business activity may continue to increase at such an even and temperate rate that the wild excitement and violent fluctuations that are the symptoms of "booming" may not be seen. A more active interest in mining and a greater desire to invest in mineral property have been very noticeable for some time past. We are also advised from London that a real "boom" has come over phlegmatic cousin John, and nothing is talked of but the great gold strike in the Transvaal, South Africa. It is said that the mine produces large amounts of seven-ounce rock. If this be so, it will go hard with the Boers to hold their country, and whatever the rest of the world may gain, they will probably lose.

But as "one swallow does not make a summer," so one find of seven-ounce ore does not create a rich mining country, though it is sufficient to excite the average London mining broker. The example of the Indian gold mines, in which so many millions have been sunk on the fortunate accident of finding one, but only one paying mine, the Mysore, among the vast number of prospects sold at the prices of good mines, makes it probable that a fresh lot of good money will go out from that great paradise of worthless mine venders. It is safe to predict its principal return will again be the valuable but unheeded experience that prospects are not mines; that an investment in the shadow of a neighboring bonanza is the most unsubstantial of values; that the prospectuses prepared by London "promoters" are generally works of pure imagination and financial will o' the wisps; and that no public mining investment is worthy of attention unless the value of the property has been ascertained and is vouched for in detail by competent, disinterested, and honest experts.

But it is not our province to warn Englishmen of the shoals and quicksands that surround Indian and African mining speculations. Nor is it possible for us to buoy every sunken reef that will wreck so many English investments in this country. For some time past, American mines have found ready sale in London, and for the most part, those offering there are either absolutely worthless, as in several cases we have exposed, or are so vastly overvalued as to be little short of swindles.

It is the old story over again: "it is all but impossible to sell a mine in London at a fair and honest value." And American mines are brought into disrepute by the dishonesty of those who float worthless property there, and the unquestioning credulity of those who invest on their "fish-stories."

Mining never was more prosperous in this country than it is to-day, and there is no other kind of investment that offers so large a reward as that prudently made in mineral property, neither is there any other country in the world that has so many good mines or offers so many of the elements of success and profit to the investor.

THE CHEAP PRODUCTION OF SODIUM.

Mr. CASTNER'S sodium process, which was referred to in the columns of this JOURNAL May 29th, 1886, has, we are informed, attracted great attention abroad, the inventor being at present in London engaged in erecting furnaces for the production of the metal on the large scale. The process is radically different from the method heretofore used. According to the older process, it is absolutely essential that the charge from which the metal is reduced and distilled should be rendered very refractory. In so doing, it has been found that the heat necessary to be used is so intense that the wrought-iron vessels quickly burn away, and also the yield of sodium rarely exceeds one third the amount actually contained in each charge. The charges of soda and carbon must be made refractory, for the reason that, were they not so, the alkali would fuse, thus separating from the light, infusible carbon, and no reduction take place whatever. Mr. CASTNER,

in his very ingenious process, prepares an artificial or mechanical compound of carbon and iron, by coking a mixture of fine iron and tar. The metallic coke, thus produced, after being ground, consists of fine particles of iron and carbon, mechanically held together, from which neither can be separated, excepting by the aid of acids. This substance is mixed with the soda compound used in such a proportion that the carbon of the iron and carbon compound shall not exceed the amount actually necessary to combine with all the oxygen of the caustic soda, preferably used for the production of sodium, by this process, on account of its fusibility. The mixture of caustic soda and reducing material is submitted to a bright red heat in large cast-iron crucibles, and the furnace so arranged that several can be treated at the same time. By introducing the several crucibles into the furnace at different times in starting, and withdrawing each when the reduction is completed in the same, then substituting new crucibles with fresh charges in the places of those withdrawn, the process becoming practically continuous, which is quite a novel feature in making sodium.

The great object of Mr. CASTNER's invention appears to be to produce a full yield of metal and also do away with the intense heat as used in the old process. In submitting the crucibles containing the charges, prepared as before described, to the action of heat, the caustic soda fuses, and, owing to the gravity of the reducing material, the carbon is held below the surface or in suspension, diffused throughout and in actual contact with the fused mass of alkali; while, the charge being fused, vessels of large diameter can be employed. The caustic soda is reduced at the edges of the mass where the heat applied externally is greatest, and the charge flows continually thereto from the center until its reduction is complete. Thus the excessive heat necessary to penetrate to the center of the refractory charge and reduce the soda there situated, as in the old process, is entirely avoided. Also, owing to the actual contact of alkali and carbon, together with the aid rendered the latter by the fine iron in exerting an extra affinity for the oxygen of the alkali, the reduction takes place at a comparatively moderate temperature, which saves the vessels from the destructive effects of high heat, and in reality allows the process to be carried on in large cast-iron crucibles, instead of small wrought-iron cylinders, which are very expensive. By doing away with the addition of a refractory material, together with an excessive amount of carbon, both of which have been necessary to the success of the old process, the two great causes that have prevented the yield of metal being over one third the amount contained in the charges have been removed.

It is almost impossible to estimate the value of this invention, should the inventor substantiate his claims to be able to produce sodium at a cost below 25 cents a pound. Not only would the price of aluminium, one of the most valuable of metals, be so much reduced as to allow of its entering into almost every commercial use, as indeed we trust it will under its cheap production by the Cowles method; but the metal magnesium will be made so cheaply that it will compete successfully with electricity as a source of light.

Boron and silicon, which up to the present have received comparatively little attention, can, by the use of cheap sodium, be made at reasonable prices, and thus may replace, owing to their varied properties, many metals and alloys for special uses.

The nitrogenous gases resulting from various chemical industries can readily be made to yield their nitrogen, in the form of ammonia, by the aid of sodium; and should this alkaline metal be procurable at the above price, it is claimed that enough ammonia can be recovered from these sources alone to supply the world's consumption at less than one half its present cost.

In view of the manifold uses to which sodium will be put if cheaply produced, and also the expressed favorable opinion of many scientists as to the claims of the inventor and the possibilities of his invention, it is hardly surprising that the process has attracted wide-spread interest. We can only hope that Mr. CASTNER will be successful, and thus add to the credit America has justly earned for its many useful inventions.

Mining Decision—Right of Appeal.—At Washington, on the 18th ult., the Assistant Secretary of the Interior decided a mining case of general interest. Samuel M. Carleton filed a protest against the issue of a patent for the Lucy B. Hussey lode mining claim at Leadville, Colorado. The petition sets forth that Carleton had been denied the right to appeal; that the patent for the claim was issued to the Wolcott Mining Company, which patent has not yet been delivered, and asks that it be withheld until the protestant's right in the premises are fully determined. Assistant Secretary Muldrow ruled on the protest. He says that a protestant is not entitled to the right of appeal is a well-settled doctrine. It is urged that, because the protestant in this case claims the right of ownership in said mine, he is entitled to be heard, though not alleging the status of adverse claimant. In the Grampian lode case, it was expressly ruled that a co-owner must protect his rights under "the form of procedure provided for an adverse claimant," and though the right of appeal was not considered in said case, such question is disposed of in the other cases cited. The applicant must seek relief in the court, where ample remedy exists, if his interests have not been properly considered. The petition is, therefore, denied.

CORRESPONDENCE.

[We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.]

Electric Currents in Rocks and Veins.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Will some of your readers kindly refer me to the latest and best works on this subject in any language, and give me some information?

W. J. Henwood, in Vol. V. of the Transactions of the Royal Society of Cornwall, p. 445, carries down the subject from 1830, when R. W. Fox first started it, to 1843; but I can not find any clue to whatever may have been done since; nor whether the existence of any "*law*" has been deduced from the observations made. Any remarks that you will be so good as to make will be valued. Yours respectfully, A SUBSCRIBER.

Comparative Efficiency of Spray and Surface Cooled Air-Compressors.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Many of your readers have doubtless been surprised to read in your issue of the 25th inst. an article on the "Comparative Efficiency of Different Types of Air-Compressors," in which a very misleading and erroneous conclusion is drawn with positive seriousness. A set of experiments made by Mr. Duncan Gilchrist, of Ishpeming, Michigan, are given, with indicator-cards and tables to show that air during compression is cooled to a greater degree in the cylinders of a Rand compressor by water circulation than by water injection, and the inference is drawn that, this being a fair test of the comparative efficiency of different types of air-compressors, the water-jacket system is more economical than that of water injection. Without questioning the merits of Mr. Gilchrist as a pneumatic engineer, or of the rival manufacturers to make economical compressors, let us look at the facts in this case. It is stated that these experiments were made with compressors using the surface system of cooling, and to them was attached "an experimental set of jets for injecting water into the cylinder." Under such conditions, it is unfair to infer that this "experimental set of jets" was as efficient in its work as the regular spray pumps and attachments employed by manufacturers of the jet system. It is easy to understand how an inefficient injection might not cool the air as thoroughly as a complete water circulation; but take the two at their best, and who would question the fact that compressed air can be cooled to a greater degree by injecting sufficient cold water in the form of spray against the compressing piston than by the most complete system of circulating cold water around the cylinder? It is stated that "with these experiments the only condition changed was the method of cooling the cylinder, and the results obtained can be attributed only to that." Hence, we infer that Mr. Gilchrist did not cool his air to as low a degree by his system of jets as he did by the regular water-jacket.

Those who are familiar with compressed air will at once infer that the jets were not properly constructed; for it is not a matter of opinion, but an acknowledged fact, that the temperature is lower in water injection cylinders than in others. One need only put his hand on any air-receiver or cylinder employing the injection system, say, for instance, an Ingersoll plant on the New Aqueduct, where both systems are used, and compare its temperature with those of the system of circulation to verify this point. Messrs. Rand, in referring to other manufacturers, are responsible for the following statement in their catalogue: "Water is injected inside the cylinder as an effective method of absorbing the heat, which it doubtless is, and moreover, it gives a very good indicator-card."

Pneumatic engineers are divided only in disputing the relative advantages of the two systems, "taking one consideration with another." The indicator-card clearly proves the economy of an efficient water injection. The total increase of temperature in compressing air to sixty pounds is 309 degrees—about the temperature of steam at sixty pounds pressure. With a jacketed compressor, working at seventy revolutions a minute, there is neither sufficient time nor contact to effect a reasonable cooling, while a spray of cold water, forced *directly into the air*, absorbs a large quantity of heat and keeps the pressure line very close to the isothermal or line of uniform temperature. Just in so far as the temperature remains isothermal, is the ecomony of the compressor increased.

NEW YORK, Sept. 30. WILLIAM L. SAUNDERS.

The Cost of Mining and Milling at the Greatest Australian Gold Mine.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In regard to your kind notice of my paper on "Costs of Mining and Milling Free Gold Ores," in your issue of September 4th, I would say that you have slightly misunderstood my remarks as to excessive costs of milling quartz in Guayana. The old Callao mill and the Potosi mill, both of which are poor affairs, were built in the United States after designs that were in vogue in California some twenty to twenty-five years ago; so I am afraid we must concede that badly designed machinery is built in the United States as well as in other parts of the world. The gold stamp-mills that are now built in England are patterned after these antiquated California mills, the makers here not having kept pace with the marked improvements in quartz-crushing appliances that have been made during the last ten or twelve years by the American mill constructors.

In regard to costs of mining and milling auriferous quartz in Australia, the following condensed statements of the operations of the Port Philip and Clunes companies may be of interest, as this is the most notable gold quartz property in Victoria, or, in fact, on the Australian continent. The figures have been derived from a paper by Mr. R. H. Bland, manager, published in the "Official Reports of the Mining Registrars for the Quarter ended March 31st, 1886; Melbourne." The weights given by Mr. Bland are in all probability expressed in long tons of 2240 pounds; for convenience of comparison, I have reduced them to short tons of 2000 pounds.

The lodes worked are stated, in a separate table in the same blue book, to be from 2 to 30 feet in thickness. The deepest shaft on the property

is now 1288 feet; its depth in 1877 (?) was 1190 feet; of late years, the quartz extracted appears to have been taken from depths of from 300 to 1100 feet. The mill has 80 heads of stamps; the weight and design of the stamps are not given. The pumping-engine has a cylinder of 24 inches diameter, and the hoisting-engine has a cylinder also of 24 inches. In rough numbers, about 80 per cent of the total product of gold is obtained from the "beds" and "boxes"—probably mortars and plates; 10 per cent from blankets; and the remaining 10 per cent from pyrites.

For the twenty years from 1857 to 1877, 1,068,636 tons were crushed, including some alluvial material, which yielded 407,608 ounces, and having a gross value of $7,883,815; the yield was hence $7.38 a ton. The profits during this period, including dividends and royalties, were $1,775,905, or $1.66 a ton. The costs may hence be assumed to have been $6,107,910, or $5.72 a ton. The largest quantity crushed in any one of these twenty years was in 1869, when 77,637 tons seem to have been beneficiated.

The results for the seven years from 1875 to 1881, inclusive, will probably give a more correct idea of the present costs in Australia for working on an extensive scale a lode of large size, as the milling appliances for the first years of the foregoing period of twenty years were poor, making the cost of crushing excessive; for the four years from 1882 to 1885, inclusive, the annual output has averaged only 26,000 tons, yielding about $4.60 a ton, and the property has been worked at a small loss for each of these four years.

For the seven years ended December 31st, 1881, 419,348 tons were crushed, yielding 117,640 ounces, having a gross value of $2,330.662, or $5.56 a ton. The profits, including royalties, were $455,774, or $1.09 a ton. Hence the costs may be assumed to have been $1,874,888, or $4.47 a ton: this about agrees with the manager's statement that the cost of mining and crushing—probably not including general expense—has lately been $4 a ton. I am told that the cost of labor, fuel, and timber at Clunes is considerably less than at Deadwood, Dakota; therefore the present total costs at the Homestake mine of about $3 a ton compare very favorably with this Australian cost of $4.47 a ton.

The crushing duty per stamp-head for 1885 is reported as 3·5 tons a day; this is, however, based upon hours at work by each stamp, which, as all mill-men know, is a very delusive method of stating the crushing capacity of a quartz mill.

HAMILTON SMITH, JR.

LONDON, Sept. 13, 1886.

Air-Jigs.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I am not in a position to discuss this subject thoroughly; but beg to offer a few facts of observation, leaving you to judge as to whether they are worth publishing. My experience, even with wet concentrators, though rather considerable as to extent of time and quantity of material treated, is quite limited as to variety of machines; and of air-jigs, I have seen only two, both experimental and neither quite successful.

The first of these machines was called the Stevens or Stevenson dry concentrator. As I saw but little of its working, and have no facts to give as to results, I need say no more than that it did not come into use. The second I saw more of, having been employed to superintend a test of its work on a lot of ore. As my report of the facts, coupled with my opinion that, "as at present constructed and operated," it was "inferior to some other machines in use," gave great umbrage to the owners of the machine, I prefer not to revive the animosity of those gentlemen by mentioning names. It is a sufficient justification of my opinion that a following trial for different parties and under other supervision gave even worse results than those reported by me, and that the contrivance was ultimately abandoned. Nevertheless, I thought I could discover in it the "promise and potency" of considerable utility to be developed by experiment in the hands of a cool-headed man understanding his business.

The machine was on the plan of the endless belt, having a strong general resemblance to the Frue vanner, minus the shaking and the water. The belt was made of some textile fabric supported by wire gauze. The ore was supplied to the belt by means of a hopper, with adjustable gate, near one end (the head), and was distributed and moved toward the foot by a series of automatically acting scrapers, which, however, did not touch the belt. The scrapers had a reciprocating movement: I thought a continuous rotation would have been better for the fine grades of ore. The belt moved in a direction opposite to that in which the ore was impelled by the scrapers, and through its pervious texture air was puffed with adjustable force and rapidity by means of a bellows. An adjustable stationary scraper near the head of the machine regulated the thickness of the stratum of ore that the progression of the belt should deliver to the headings-box, the remainder passing off at the foot of the moving table (the belt) under the action of the scrapers. It was intended that the movement of the belt should be automatic and continuous, while also adjustable, precisely as in the Frue and other such concentrators; but in this trial, it was moved at intervals by hand through the agency of a crank.

The ore, simply air-dried, was first sized to, I think, six grades, of which the finest passed 120-mesh gauze. Each lot was weighed and was passed over the machine more than once, in order, as was stated, to show the result of passing it over a series of machines. The result on the first or coarsest grade was 92 per cent of the value in the form of very clean headings. (I write from memory, not having a copy of my report at hand.) The next finer grade gave 86 per cent of the value, and each succeeding grade less, until, with the finest, of which there was an undue proportion, owing to the manner of crushing the ore, no concentration could be effected. The total result was 62 per cent of the value saved, not counting the residual fine dust that could not be concentrated on the machine. This fine dust, which the air-jig could not handle to any purpose, was readily concentrated by hand in the wet way.

The ore from the same mine, similarly crushed, had been and was subsequently for years successfully concentrated without sizing by the Frue vanners. When I had charge of the vanners, my orders were to make headings worth 1000 ounces of silver to the ton as a minimum value; and under this restriction, and without sizing, the Frues saved 84 per cent of the value, leaving tailings containing native silver inclosed in particles of copper pyrites, zinc-blende, and heavy-spar, which, if allowed to pass over the head of the machine, would, while raising the percentage of value saved to 90 per cent or over, have reduced the contents of the total headings to 300 or 400 ounces per ton, which was contrary to orders.

I proved by repeated experiment that a reconcentration of these tailings would yield 65 per cent of their value in 12 per cent of their weight in the form of a material containing from 30 to 50 ounces of silver per ton. This waste had gone on for years, and, notwithstanding my investigations and reports to the management, no efficient means were taken to stop it until some two years later, when, as I am informed, something effectual was done. In the mean time, I estimate the loss to the company to have been not less than $120,000 free of cost. There will not be wanting those who will recognize these statements as applying to the Silver King works in Arizona.

To return to our muttons. The work done by the air-jig described on the coarser grades of ore seems to me to indicate a probability that, by some modification of structure and operation, it might be made to yield also good results from the fine stuff. No attempt was made to remove the absolutely impalpable dust by means of fans or suction during the sifting; nor were any means provided for changing the belt for one of finer texture. The dusting was insufferable when the fine stuff was under treatment; that might be prevented, in a measure, by a cover. The action of the reciprocating scrapers was too violent, flipping the ore into the air, especially on the return movement.

The main difficulty seems to be this: There is, in almost all ores, a proportion of clayey or talcose matter as well as certain tender sulphurets, which, in the crushing, acquire a floury fineness and consistency, and, like flour, have the property of clotting and clinging. This is often noticeable in dry crushing batteries. The trouble is greatly aggravated when the ore is not perfectly dry, and is correspondingly diminished by thorough drying, and even heating to a rather high degree. By an abundance of water, the difficulty may also be overcome; at the expense, however, of encountering another. The ore must be either thoroughly wet or thoroughly dry; mere air drying is not sufficient. Every metallurgist who has had occasion to roast such floury material must have observed that, at a certain temperature, even short of that at which combustion begins, it loses coherence and adherence, and becomes almost as mobile as a liquid. Would it not in this state yield more satisfactorily to the action of the air-jig? But it might burn the belt. Well, use a belt of asbestos cloth.

So far as my limited knowledge of the subject goes, I am not one of those who think, either on practical or on theoretical grounds, that air is superior or equal to water as a medium for the concentration of ores in general. In the air-jigs, it seems that only one principle can be, or at least has been applied, namely, the difference of falling rate through a resisting medium, caused by difference of specific gravity. But several circumstances operate to modify the falling rate, among which, but hardly the most important, is the difference of mass of the falling particles. Another, scarcely less important, is the difference in form. The first, except in so far as it is complicated by the second, can be in a measure overcome by the process of sizing by sieves; hence all the air-jigs necessitate the application of this process. But the adverse influence of certain forms can not be thus eliminated.

Now, in certain kinds of wet concentrators, such as the Frue, the Embrey, the Triumph, and the Hendy, the influences of size and form are made to co operate, within limits, with that of specific gravity, so that, although it may be advantageous to avoid extreme variations, the necessity for sizing is not by far so urgent as in other classes of wet machines, and in all of the air-jigs so far heard from.

As a matter of fact, as I believe, the wet concentrators in use in the West will give good results in the face of an obstacle that would be fatal to many of the machines in use elsewhere, and to air-jigs in particular. Nevertheless, a good air-jig, not too costly, is a very desirable thing under certain conditions, notably in case of a scarcity of water.

C. H. AARON.

THE BURMESE MINT.

The *Journal of the Society of Arts* gives a description of the process of coining under King Theebaw:

The smelting of silver for producing the currency of the country is carried on in the following manner: Silver, purchased from the Kakhyens (who procure it from the Chinese) to the amount of 6 *ticals* (say 3¾ ounces) is mixed with 1½ *ticals* (378 grains) of copper wire, and the two metals are melted together, the smelter adding sufficient lead (judging the weight) to make up the total weight to 10 *ticals* (5½ ounces). The smelting is conducted in little saucers of sun-dried clay placed on a bedding of paddy husk to make them lie evenly; charcoal is heaped up over them in hollow pyramids, which, being ignited, the bellows are then vigorously applied. As soon as the metals fuse, little pieces of lead are put in, according to the judgment of the smelter. When the mass is at a red heat, the charcoal is removed, and if a piece of wood, which is now held over the alloy, freely ignites, a round, flat, brick button, about the size of a five-shilling piece, on which a smooth layer of moist clay has been spread, is laid on the surface of the molten mass, two men previously blowing upon it through bamboo tubes. The brick disk does not cover the whole of the alloy, and the surplus metal around the edge forms a thick ring, to which lead is freely added to bring the mass up to the proper size and weight. As it solidifies, there forms a white disk of silver surrounded by a thick dark brownish ring, containing metal of the same purity as the disk, but covered with a coating of refuse and lead. The mass is removed from the saucer before it is perfectly hard, and the brick disk falls off, leaving the coating of moist clay adhering to the silver, which is then cleaned, and a number of round spots are dotted with cutch on the face of the alloy, to make the mass look pretty. It is then weighed and is ready for cutting up. The saucers in which the alloy is melted are sold at 80 rupees (£8) per 1000 to the lead smelters, who extract any silver and lead that may remain: and the refuse of the smelting is sold to the potters, who use it as a glaze for tiles, while it appears to be sometimes also employed in *niello* work.

THE DUC D'AUMALE'S GREAT GIFT.

The gift of Chantilly to the Institute of France renders the following particulars interesting :

THE FRENCH INSTITUTE.

The Institute of France dates from October 25th, 1795, when all the royal French academies were combined in one body called the "Institut National," which afterward was changed to Royal, Imperial, and again to National.

The academies included in the Institute are the—

French Academy, founded by Cardinal Richelieu in 1635 ;

Academy of Inscriptions and Belles-Lettres, founded by Colbert, in 1663 ;

Mathematical and Physical Sciences, also founded by Colbert in 1666 ;

Fine Arts, founded in 1648 ; and the

Academy of Moral and Political Sciences.

These academies comprise in all 33 sections, and have 223 members, 35 honorary members, and 31 foreign members.

The Institut Building is situated on the left bank of the Seine, opposite the Louvre. It has wings, with arcades and a dome. In front of it is a statue of the republic. The building was erected in the latter part of the seventeenth century, on the site of the Hôtel de Nesle, famous in the history of Margaret of Burgundy. During the revolution, it was used as a prison. To become a *Membre de l'Institut* is the object of every literary and scientific Frenchman's highest ambition. The annual meeting of the Institut takes place October 25th.

CHANTILLY AND THE DUC D'AUMALE.

Chantilly, which is about an hour's ride by express train from Paris, is a town of four thousand inhabitants, and is famous for the race meetings held there in May, September, and October of each year.

The châteaus descended to the Duc d'Aumale from the Condés. He was deprived of his ancestral property, however, during the Second Empire, but it was restored to him by a decree of the National Assembly in 1872. The Forest of Chantilly covers 6125 acres, and through it runs a broad road past the race-course, which includes a splendid piece of ground of 150 acres, which has been rented to the jockey club, and adjoining which are the stables erected in 1735 by Louis Henri de Bourbon.

At Chantilly have been kept three-score horses and two packs of boar and stag-hounds ; there are coach-houses, riding-schools, and innumerable other outbuildings, while within the castle are magnificent works of art, statuary, etc., and a picture-gallery containing paintings by Raphael, Poussin, Annibal Carracci, Delaroche, Ingres, and other great ancient and modern masters.

The Duc d'Aumale is considered the most accomplished of all the sons of Louis Philippe. In his day, he has been artist, author, sportsman, a skillful rider, and a brilliant conversationist, which he is yet, at the age of sixty-four. He was made a member of the French Academy in 1873, to fill the place made vacant by the death of Montalembert, and delivered an address eloquent, dignified, impassioned, and pathetic.

A SKETCH OF THE BOLIVIAN REPUBLIC, SOUTH AMERICA.

Written for the Engineering and Mining Journal by Frederick G. Corning, M.E.

(*Concluded from page* 222.)

The development of Bolivia's mineral resources may well be claimed to be the most important of her national industries ; for included in her prodigious mineral wealth, which numerous documents in European libraries prove to have influenced the political and monetary history not only of Spain, but of the entire commercial world, there are many gold, silver, copper, and tin ores, whose extraordinary richness gives a large profit margin, in spite of the excessive freight costs.

The name and fabulous riches of Potosi are familiar to every one. Its discovery in 1544 is among the oldest mineral records, and the products up to 1572 amounted to $250,000,000 ; from 1572 to 1627, $340,000,000 ; from the middle of the seventeenth to the eighteenth century, the records of Potosi show an annual average production of from $2,500,000 to $3,500,000 ; and, according to data contained in letters written to the king of Spain in 1627, the compilations of Friar Joseph G. De Acosta, and the Annals of Potosi, the Cerro Rico de Potosi or Rich Silver Mountain, has produced up to the present time upward of £400,000,000 sterling of silver.

Prior to 1825, the industry was erratic, and mining operations were frequently paralyzed by political troubles. Among the earliest interferences was the civil war in Spain in 1623, which extended to Potosi, causing abandonment and ruin. The war of independence in 1809, ending with the peace declaration of 1825, caused another suspension in mining and a general impoverishment of the country. Since the independence of the republic, however, mining enterprises have never been disturbed through political causes, and the irregularities occasioned by revolutionary movements have not extended to the mining regions or caused injury to corporations. On the contrary, the production of precious metals has never ceased to be encouraged and fostered ; and while miners are not required to pay taxes, the export duty of silver is only one peso or eight reals per mark (58 cents per 0 5065 pound avoirdupois), gold being free, and machinery imported for exploitation entirely exempt from taxation.

The largest producing mines appear to be concentrated *par excellence* in the southern part of the republic, namely, in the departments of Potosi, Tarija, Chuquisaca, and Oruro. The former includes, besides the mines of Potosi, the Huanchaca and Quolquechaca groups, of which the controlling interests are owned by Señores Pacheco, Arce, and Ramirez, the bonanza kings of South American mining, who are reported to receive annually in the neighborhood of $3,000,000 as their share in the combined dividends of these properties.

The growth of Bolivia's leading industry, however, is seriously retarded for want of more roads, proximity to accessible seaports, timber, and a better fuel than *taquia* and *yareta* (llama-dung and moss) in the silver lode districts. But these disadvantages under which mining has labored until within late years, of which the difficulty attending the transportation of machinery has been perhaps the greatest, have become somewhat diminished ; for, by means of the Mollendo-Arequipa-Puno Railroad, connecting with the steam navigation on Lake Titicaca, and the stage-roads from Chililaya (or Puerto Perez) to La Paz, and from thence to Corocoro and Oruro, an extensive mineral territory is made easier of access ; while the steady advance of the railroad system now extending westward in the Argentine Republic toward Southern Bolivia, is greatly facilitating the reopening of the Potosi Mining District that has lately been undertaken by a strong English-Bolivian company.

The gold of Bolivia is chiefly derived from placer mines along the rivers coursing through the section of country embracing the eastern slopes and foot-hills of La Paz Cordillera. At the present time, gold mining operations are carried on in a primitive way by the natives, who wash the richer gravel deposits in the *batea*. The *batea* is a circular, shallow wooden dish or bowl eighteen inches in diameter, for separating, through continuous use of water, the grains of gold from the dirt, sand, pyritic matter, magnetic iron, etc., and is to the South Americans what the pan is to the California miner. It produces the most accurate and prompt separation, manipulated in experienced hands, and on many accounts is preferable to the North American pan. The gravity of the gold resists the centrifugal power of the water, and remains near the bottom of the vessel, forming the extreme point of a sector, while the lighter particles move forward toward the periphery, arranging themselves according to their specific weights, and spreading over successively greater areas in the sector. Where flat gold predominates (as in Tipuani), the *batea* is far superior to the pan, as the fibers of the wood exert a maximum friction in contact with the smooth, flat gold surfaces, working against the escape of the metallic particles that adhere tenaciously to the sides and bottom of the wooden pan.

The government records show that the exports consist largely of the precious metals. For example, during 1883, for which year most accurate statistics appear to have been kept, they amounted to $21,988,729, of which $20,970.883.78 fell to the mineral production, $9,086,647 of which product was shipped via the Argentine Republic to Buenos Ayres, the remainder passing over the mountains to Arica.

At one of the late national conventions, the mining laws were carefully revised, and the new Spanish Code substantially adopted, thus materially simplifying the tenor and title of property, with the view of favoring the development of the industry and inviting the investment of foreign capital. Among its fundamental provisions, are :

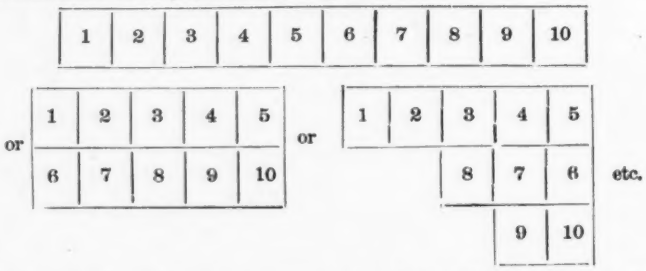
1. On lands belonging to the public domain, and also on unfenced private property, minerals and mines may be sought, applied for, granted, and worked. Within fenced ground, the proprietor's permission or judicial license must be first obtained,

2. All individuals possessed of civil rights may apply for and obtain one or more *pertenencias* (one pertenencia = 100 m. square = 1 hectaréa) in one concession, not, however, to exceed 30 *pertenencias* (or 30 *hectaréas*).

= 10,000 square meters = 1 pertenencia = 1 hectaréa.

The *pertenencias* constituting one concession may not be scattered, but must border on one another (having common side-lines), forming a right-angular polygon.

A concession of 10 pertenencias may be :



3. Priority of application ("presentacion de la solicitud de concession") has the preference, however slight the difference in time.

4. Gold or tin deposits or other metallic minerals occurring in rivers, placers, pockets, irregular deposits, or bedded veins, on public or private lands, are subject to the same law applicable to all mineral concessions.

5. The claimant is owner of and may work to an unlimited depth, all the ground, veins, deposits, and mineral occurrences, within his surface claim and within the vertical planes passed through all the surface boundary lines of such claim.

His title to and working privilege do not extend, however, to deposits and such portions of deposits, either in direction of strike or dip, or in any other direction, that are situated outside of or have departed from the ground inclosed within such vertical plane limits.

6. Parties exploiting in or into such adjoining ground, having passed the surface lines and vertical plane limits of their own claim, are compelled to return the minerals or an equivalent thereto to the party whose claim they have trespassed upon. And in the event of it being proved that such trespassing was carried on knowingly or with malicious intent, the offense becomes criminal, and the party committing the same is punished accordingly.

7. The concessions are perpetual in duration as long as the yearly *patente* of 5 bolivianos (5 Bolivian dollars) per *hectaréa* is regularly paid.

8. The *patente* must be paid in half-yearly installments in advance. It may, however, be paid several years ahead if preferred.

9. In case of failure to pay the *patente* for a period of one year, the claimant forfeits his right, title, and interest in and to the claim ; and his property is sold out at auction to the highest bidder, when the claimant receives the surplus, after the amount of his indebtedness, plus costs and plus 10 per cent of the entire amount for which the property was sold are

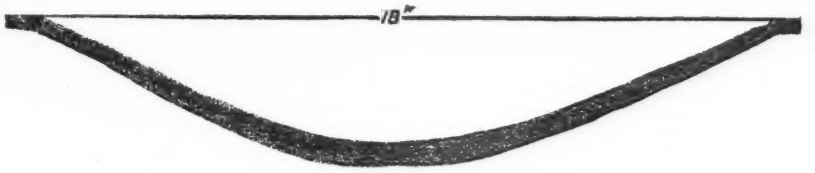
deducted from such amount realized by sale. And in case no bidder appears, the land is returned to and becomes part of the public domain, and is reopened to location and exploitation.

With all the natural resources, however, that should combine to make Bolivia an extraordinarily rich and prosperous country, it must be acknowledged that, with exception of the calisaya bark and coca plantations and the operations of a few of the better regulated mining enterprises, every thing is in a surprising state of backwardness. And at first sight, one marvels at this condition of things in the midst of such boundless riches.

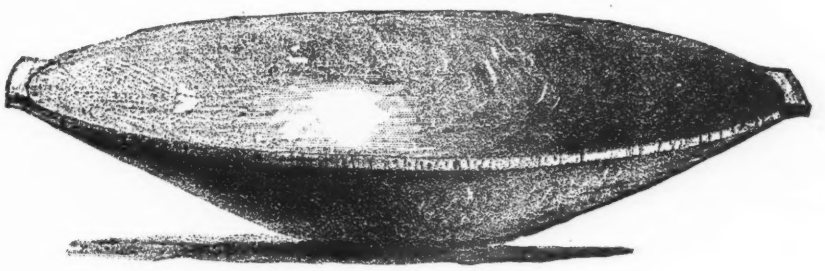
Each new administration has begun with strong endeavors to pursue a policy conducive to business activity and to the elevation of the country from its dull torpid industrial condition to the rank of a thriving progressive state, commensurate with the variety and exceptional richness of her resources. Liberal and numerous concessions have been granted for roads and other public improvements; yet, for the greater part, nothing but trails connect the cities, traveled by mules, llamas, and Indians, the beasts of burden of the republic.

It is true there are navigable rivers to the east, and although there have been ably projected plans for their utilization, still their conversion into efficient fluvial highways remains unaccomplished. For instance, in 1868, a navigation company was formed with a large concession from the government, having as its object the opening up of a route down the rivers Mamore and Madeira to the Atlantic. The scheme was promising, and would have given easy access to half a million square miles of valuable land in Bolivia and Brazil, traversed by immense rivers, forming a natural canal system possessed by no other country in the world. But up to the present time, there have been no active steps taken toward the realization of these designs, and the traffic in that direction, confined almost exclusively to the exportation of rubber and hides, is expensive and tedious, not to speak of danger from the more savage Indian tribes attending the back passage, up the rivers of the interior of Brazil.

Another project is now discussed, to continue the navigation of Lake Titicaca through Rio Desanguadero to Lake Poopó, and by means of a new railroad line from Chililaya to La Paz, in substitution for the present stage road, and the navigation of other subordinate rivers farther south, to connect La Paz, Corocoro, Barca, Oruro, Cochabamba, Colquechaca, Sucre, Huanchaca, etc., with the view of diverting the Argentine-Atlantic and La Paz-Chilian trade northwestward through Bolivia and Peru to Mollendo. But, according to the writer's views, there are



SECTION OF A BOLIVIAN BATEA, LARGE SIZE



BOLIVIAN BATEA

SKETCH SHOWING METHOD OF SLUICE WASHING PRACTICED AT TIPUANI.

obstacles in the way of this scheme, to overcome which would involve the solution of engineering problems at a cost entirely disproportioned to the advantages gained.

To an American traveling in Bolivia, the question naturally suggests itself: Why this backwardness and general stagnation?

From a careful geographico-topographical study of the stupendous Andes chain, which has broken up and elevated to great altitudes the western part of the republic, forming a colossal barrier against the coast, it is evident that a peculiarly isolated, inaccessible position and great difficulty in building good roads are the main causes that have operated in preserving the country's primitiveness. Added to this, it must be remembered that the development of the country has been in the hands of a people of whom by far the great majority are remnants of a nation doubly fallen. For even before the advent of the Spaniards over three centuries ago, during which time the Quichuas and Aymarás had been enslaved, persecuted, and forced into degeneracy, history tells us that the imperial glories of the Incas were but the last gleams of a civilization of a thousand years' standing, whose massive monolithic monuments, innumerable forsaken towns, ruined public works, terraced mountains, and crowded cemeteries, in the historic ground bordering the mysterious Titicaca, bear witness to a much higher scale of culture. And after a continued decline and free mixture with the Spanish invaders for more than three hundred years, it is hardly a matter for surprise that the resulting Cholos and half-castes should show little or no ambition for advancement, and the white constituency have absorbed in a high degree the phlegmatic, depressed disposition of the controlling Indian element, whose ignorance, utter want of purpose and life, and low standard of comfort, constitute the real secret of the characteristic stagnation not only in Bolivia, but in other South American States.

In a word, the consideration of the country's situation from a politico-economic point of view leads to the conclusion that, of the five factors that Lord Bacon and Bishop Hall have well said go to make a nation great and prosperous, namely, a fertile soil, busy workshops, easy conveyance for men and commodities, knowledge, and freedom, only the first and last are at all represented up to the present time in this beautiful and interesting republic, so appropriately called the Switzerland of South America.

No. 78 Broadway, New York City.

REMARKS ON MANUFACTURE OF SPIEGEL FROM FRANKLINITE RESIDUUM.

Written for the Engineering and Mining Journal by Carl Henrich, M.E.

The following article has been suggested to me by a coincidence of circumstances. While engaged in the knotty problem of fluxing properly an abnormally aluminous ore in copper smelting, I had occasion to read and study the very interesting and instructive article of Mr. George C. Stone, on the manufacture of spiegel from franklinite residuum. (Engineering and Mining Journal, March 20th, 1886, *et seq.*) I was struck, during the reading of the article, by the similarity of the difficulties of his task with the one I then had in hand. This induced me to investigate the process described by Mr. Stone in the light of the theory that I had been forced to adopt in my own case, and I may say that, as I expected, I found the difficulties in both cases were of the same nature, and, I have no doubt, may be overcome in the same manner.

The large amount of alumina in the clinker and in the anthracite ash, both entering, of course, into the composition of the cinder, is, aside from the zinc, the main source of trouble in the manufacture of spiegel from franklinite residuum. The zinc has heretofore aggravated the cause, by prohibiting the use of higher furnaces. The present hight of 30 feet seems already too large, and I have no doubt that spiegel might be produced in lower furnaces quite as economically as at present in the higher ones, if the right composition of cinder were made. The higher the furnace, the larger the blast pressure that we can employ, and the higher, therefore, also the temperature that we may obtain in the furnace. This latter circumstance again means that we may, in a higher furnace, and with an attainable higher temperature, produce a cinder that will be fluid in this higher temperature, but that would be sticky and form scaffolds in a lower temperature, that is, in a lower furnace in which the necessary blast pressure was not obtainable. In perusing Mr. Stone's article, we shall find that scaffolding was a main trouble with the old low furnaces, which otherwise worked well enough.

It is, on account of the large amount of zinc remaining in the clinker, beyond a doubt desirable to have as low a furnace as possible, while at the same time high enough for iron and manganese reduction and smelting. A furnace from 20 to 24 feet high ought to be sufficient, the old furnaces described by Mr. Stone being only 19 feet in hight.

Mr. Stone says (page 208), March 20th, 1886: "The clinker is lean and rather siliceous; it carries, however, nearly enough lime, magnesia, and alumina to flux the silica. The alumina is far from being a desirable ingredient, as I shall endeavor to show when speaking of the cinder made." And, on page 230, March 27th, 1886: "The usual cinder is nearly a singulo-silicate. Exactly what is the best composition is hard to determine. One would suppose, as has indeed frequently been stated, that the more lime and magnesia, provided the cinder remain sufficiently fusible, the less manganese it would contain. I have found this to be true only if the alumina is low. If the silica is low and the lime and alumina high, the manganese will be high, and the cinder look acid. Something similar has been noticed with lead slags, which are also singulo-silicates. It has been recommended to make a cinder in which the oxygen of the bases, exclusive of MnO, equals or exceeds the oxygen of the silica. This answers well, if the alumina can be kept low; otherwise, it is better to have less lime. Unfortunately, our cinder usually contains so much alumina that it is impossible for us to make it as basic as is desirable. My practice has been to calculate a cinder in which the oxygen of all the bases, including MnO, equals the oxygen of the silica, assuming that half the manganese in the clinker will go in the cinder. This is about the proportion that is lost at present."

The main difficulty seems to have been that alumina has been considered as a base instead as an acid in the composition of the cinder.

On page 230 (March 27th, 1886), we have the following nine representative analyses of the cinder produced:

	1.	O.	2.	O.	3.	O.	4.	O.	5.	O.
SiO_2	34·66	18·5	33·72	18·0	33·68	18·0	32·60	17·4	37·48	20·0
Al_2O_3	8·87	4·1	8·63	4·0	13·00	6·1	13·06	6·1	9·12	4·3
FeO	2·43	0·5	3·38	0·7	0·68	0·1	2·85	0·6	1·68	0·4
MnO	15·44	3·4	15·45	3·4	15·89	3·6	13·07	2·9	12·99	2·9
CaO	29·66	8·5	30·17	8·6	30·38	8·7	30·58	8·7	23·88	6·8
MgO	8·46	3·4	8·56	3·4	6·27	2·5	6·54	2·6	13·74	5·5
Total	99·52	38·4	99·91	38·1	99·90	39·0	98·70	38·3	98·89	39·9
I. O : O	18·5	: 19·9	18·0	: 20·1	18·0	: 21·0	17·4	: 20·9	20·0	: 19·9
II. O : O	22·6	: 15·8	22·0	: 16·1	24·1	: 14·9	23·5	: 14·8	24·3	: 16·6

	6.	O.	7.	O.	8.	O.	9.	O.
SiO_2	36·64	19·5	36·80	19·6	38·78	20·7	33·58	17·9
Al_2O_3	12·08	5·6	9·08	4·3	13·30	6·2	9·88	4·6
FeO	1·78	0·4	1·54	0·3	2·57	0·6	1·20	0·3
MnO	9·54	2·1	9·62	2·2	10·45	2·3	7·62	1·3
CaO	28·40	8·1	28·08	8·0	24·30	6·9	35·47	10·1
MgO	11·12	4·4	13·92	5·6	11·78	4·7	11·19	4·5
Total	99·56	40·1	99·04	40·0	101·18	41·4	58·94	39·1
I. O : O	19·5	: 20·6	19·6	: 20·4	20·7	: 20·7	17·9	: 21·2
II O : O	25·1	: 15·0	23·9	: 16·1	26·9	: 14·5	22·5	: 16·6

I. is the ratio of the oxygen of silica to the combined oxygen of the bases, considering alumina—after the usual manner—as a base.

II. is the ratio of the oxygen of the combined acids (Al_2O_3 and SiO_2) to the oxygen of the combined bases (CaO, MgO, FeO, and MnO).

Comparing analysis 2 with 9, we see the beneficial effect of a larger amount of dolomite as a flux, and a consequent decrease of the percentage of manganese. A still larger increase in the percentage of CaO and MgO in the cinder 9, would doubtless lead to a still lower percentage of MnO in the cinder, and consequently to a larger percentage of Mn in the spiegel.

The same is true, if we compare Nos. 5 and 7. Mr. Stone says of cinders 4–8 inclusive: "No. 4 shows the effect of high alumina and lime with low silica. No. 5 is rather too acid. Nos. 6 and 7 are good. No. 8 is high in alumina and silica, but still a good cinder. I am inclined to think that relatively too much importance has been attached to the composition of the cinder."

If No. 5 really was too acid, or rather, if the reason of its high percentage in MnO was to be attributed to it, then the composition of the smelting charges must need the very closest watching, much closer than is possible to do in practice. Besides, we have No. 4 with the basic ratio of 17·4 : 20·9 and with even more MnO than the nearly correct ratio 20·0 : 19·9 of No. 5.

I should rather think that the above-given analyses of cinder clearly show that the desirable composition of the cinder is somewhere near the formula:

$$2RO.Si(Al)O_3$$

I am going back to the old formula SiO_3 for silica, as it simplifies the formula for the cinder composition and makes SiO_3 and Al_2O_3 interchangeable. A cinder in which RO would be occupied by CaO alone, and with about $1Al_2O_3$ to $3SiO_2$ or 51·4 alumina to 135 silica, somewhere near the ratio actually obtaining in the analyses of cinder given above:

$8CaO \left\{ \begin{matrix} Al_2O_3 \\ 3SiO_3 \end{matrix} \right.$ or 54·6 per cent lime, 12·4 per cent alumina, 33 per cent silica, would be too infusible probably for a 24-foot furnace. But a slag of about the composition—

$5CaO \left. \right) \left\{ \begin{matrix} Al_2O_3 \\ 3SiO_3 \end{matrix} \right.$ or 36·3 per cent CaO, 15·5 per cent MgO, 13·3 Al_2O_3, and $3MgO \left. \right) \left\{ \begin{matrix} Al_2O_3 \\ 3SiO_3 \end{matrix} \right.$

34·9 per cent SiO_3 would be fluid enough, and at the same time melt at a sufficiently high temperature to satisfy all the requirements of spiegel smelting in low furnaces.

I am compelled to differ from Mr. Stone in the degree of importance to be attributed to the composition of the cinder, and must agree with those authorities that maintain that the more lime and magnesia, provided the cinder remain sufficiently fusible, the less manganese it will contain. This is, of course, true only in certain limits, indicated, as already stated, by the fusibility of the cinder on the one hand, and by a too low smelting temperature of the cinder on the other.

I have been smelting a cinder of the composition—

$$3RO.Si(Al_2)O_3$$

in a common water-jacketed copper cupola, with a burden of from 4½ to 5 pounds of smelting charge to 1 coke. Only 16 per cent of the cinder was FeO: and for a short time the percentage of FeO was as low as 8 — no MnO—without causing any difficulty. The smelting point of the cinder $3RO.Si(Al_2)O_3$ was too low to keep the crucible of the furnace properly hot, so that I had to increase the amount of silica and alumina to

$$2RO.Si(Al_2)O_3$$

I am certain that the cinder $(5CaO + 3MgO).(Al_2O_3 + 3SiO_3)$ will be fusible enough on the one hand, and of a high enough melting-point on the other hand, to keep the furnace in good shape, while melting spiegel from residuum.

To arrive at what I consider the proper charge for the melting of spiegel from the franklinite residuum, using Lehigh coal and High Bridge dolomite, I shall take the analyses as given in Mr. Stone's article. And I may here add the method employed by me in "making up" smelting charges. I have found this method to work nicely and quickly —quicker indeed than any other I am acquainted with.

I first of all determine on the character of the cinder that I propose to produce in smelting, whether a singulo-silicate aluminate, or a sesqui-silicate aluminate, or a bi- or tri-silicate aluminate.

Having, in this case, determined on a sesqui-silicate aluminate, I

investigate the analyses of all the materials entering or liable to enter the composition of the slag or into the smelting charge.

In the case in hand, we have:

1. *Broken Lehigh Coal:* Ash = 12·8 per cent.

Analysis of ash (page 208):

$$\left.\begin{array}{lll} SiO_2 & = 49{\cdot}6 = 26{\cdot}45\ O \\ Al_2O_3 & = 27{\cdot}6 = 12{\cdot}88\ O \end{array}\right\} = 39{\cdot}33\ O.$$

$$\left.\begin{array}{lll} Fe & = 10{\cdot}8 & \\ CaO & = 2{\cdot}4 = & 0{\cdot}69\ O \\ MgO & = 3{\cdot}6 = & 1{\cdot}44\ O \end{array}\right\} = 2{\cdot}13\ O.$$

Iron being produced in the metallic state, it is undesirable that it and also Mn should enter the composition of the slag. The oxygen combined with it is therefore neglected in this investigation. We have in 100 pounds ash 39·33 pounds acid oxygen and 2·13 pounds basic oxygen. The latter require 3·19 pounds acid oxygen to their satisfaction in a sesqui-silicate aluminate, the cinder to be produced. We have therefore left 39·33 — 3·19 pounds = 36·14 pounds acid oxygen, which will need $36{\cdot}14 + \frac{2}{3} = 24{\cdot}1$ pounds basic oxygen to flux the whole of the 100 pounds of ash into a sesqui-silicate aluminate.

One hundred pounds ash are equal to 36·14 pounds acid oxygen, and want 24·1 pounds basic oxygen.

2. *Clinker:* Analysis (average of 1, 2, and 3, page 208):

$$\left.\begin{array}{lll} SiO_2 & = 22{\cdot}8 = 12{\cdot}16\ O \\ Al_2O_3 & = 5{\cdot}6 = 2{\cdot}61\ O \end{array}\right\} = 14{\cdot}77\ O$$

$$\left.\begin{array}{lll} Fe & = 22{\cdot}9 & \\ Mn & = 12{\cdot}9 & \\ CaO & = 11{\cdot}2 = & 3{\cdot}20\ O \\ MgO & = 2{\cdot}3 = & 0{\cdot}92\ O \end{array}\right\} = 4{\cdot}12\ O$$

It will take 6·18 acid oxygen to satisfy the 4·12 basic oxygen, leaving 8·59 acid oxygen unprovided for, requiring 5·72 basic oxygen to form the kind of slag determined on; or

One hundred pounds clinker are equal to 8·59 pounds acid oxygen, and want 5·72 pounds basic oxygen.

3. *Dolomite from High Bridge:* Average analysis (page 209):

$$\left.\begin{array}{lll} SiO_2 & = 2{\cdot}73 = 1{\cdot}45\ O \\ Al_2O_3 & = 0{\cdot}44 = 0{\cdot}20\ O \end{array}\right\} = 1{\cdot}65\ O$$

$$\left.\begin{array}{lll} Fe & = 1{\cdot}10 & \\ CaO & = 29{\cdot}32 = 8{\cdot}38\ O & \\ MgO & = 20{\cdot}59 = 8{\cdot}24\ O & \end{array}\right\} = 16{\cdot}62\ O$$

Of the basic oxygen, 1·10 pounds will be sufficient to satisfy the 1·65 pounds of acid oxygen in 100 pounds of this dolomite, leaving 15·52 pounds basic oxygen available for fluxing purposes, enough to satisfy 23·28 pounds of acid oxygen in a sesqui-silicate aluminate.

Nine hundred pounds of coal, the smelting coal unit, contain 9 × 12·8 pounds ash = 115·2 pounds ash, and are equal, therefore, to 1·152 × 36·14 pounds acid oxygen, or 41·63 pounds.

900 pounds of coal = 41·63 pounds acid oxygen.
1200 pounds of clinker = 103·08 pounds acid oxygen.

= 144·71 pounds acid oxygen,

which require $144{\cdot}71 \times \frac{2}{3} = 96{\cdot}47$ pounds basic oxygen, or $\frac{96{\cdot}47 \times 100}{15{\cdot}52}$ = 621·6 pounds dolomite, or, near enough, 620 pounds dolomite.

We have, therefore, as smelting charge:

900 pounds coal, 1200 pounds clinker, and 620 pounds dolomite, instead of the present charge of 900 pounds coal, 1200 pounds clinker, and 275 pounds dolomite.

I have no doubt that no similar charge has ever been tried in smelting spiegel from residuum. The burden of 1200 pounds clinker and 620 pounds dolomite might be too heavy for 900 pounds of coal. I do not believe so. But if this should be so, even a considerable increase in the weight of the coal would be no objection to this charge, if it resulted, as the writer thinks it would, in a larger production of spiegel of a higher percentage of manganese from the same amount of clinker. The formula of the cinder might have to be slightly changed from $2RO.Si(Al_2)O_3$ to a more acid or a more basic cinder, to obtain the best possible results; but these will only be obtained by considering alumina as an acid, and providing enough lime and magnesia, to satisfy the alumina as well as the silica, without infringing on the MnO of the clinker.

This is one of the instances in which the assignment of alumina to the *rôle* of a base has worked much mischief, and kept good metallurgists from seeking the proper remedy in the right direction.

In conclusion. I may warn fellow-metallurgists against the attempt to smelt higher silicate-aluminates in low cupolas, as, with a low blast pressure, they will lead to serious scaffolding of the furnace.

NELSON, July, 1886.

Antidote to Blue Monday.—On the continent, at one works, an experiment of an interesting character has been made in order to prevent the evils arising from all the workmen being in funds at the same time. The staff is alphabetically divided into four groups, each of which is paid fortnightly; one on Tuesday and one on Friday of one week, the other two on the same days in the following week. The results are said to be satisfactory as regards the prevention of temptation to general excessive drinking, there being about 1400 hands employed.

Coal Mining is not an Extra-Hazardous Occupation.—That coal mining is not a more dangerous occupation than many others, is, says the *Colliery Guardian*, shown by statistics just published in Germany in accordance with the new law concerning employers' liability. These statistics cover the period of eight months from October 1st, 1885. In that period, the number of accidents in the whole of the German empire was 14,081 or 40·4 per 1000 workmen. In the section of Bonn, the accidents amounted to 38·3 per 1000; in the section of Bochum, to 45·8 per 1000; in the section of Clausthal, to 17·7 per 1000; in the section of Halle, to 31·8 per 1000; in the section of Waldenburg, to 44·9 per 1000; in the section of Tarnowitz, to 33·4 per 1000; in the section of Dresden, to 65·1 per 1000; and in the section of Munich, to 33 per 1000. The first three of these sections are mining districts.

THE END-LINES AND THE EXTRA-LATERAL RIGHT.*

Another of the Iron Silver Mining Company's cases has been decided by the United States Supreme Court, namely, the case against the Elgin Mining and Smelting Company, involving the difficult and important question of end-lines.

The suit concerned the title to certain mining ground, conceded to lie under the surface of the Gilt Edge location of the Elgin Company, but worked by the Iron Company, and claimed by that company as being part of a vein, the apex of which was located in the Stone claim, and which the Iron Company had followed on the dip into the Gilt Edge. The situation will appear from the accompanying diagram:

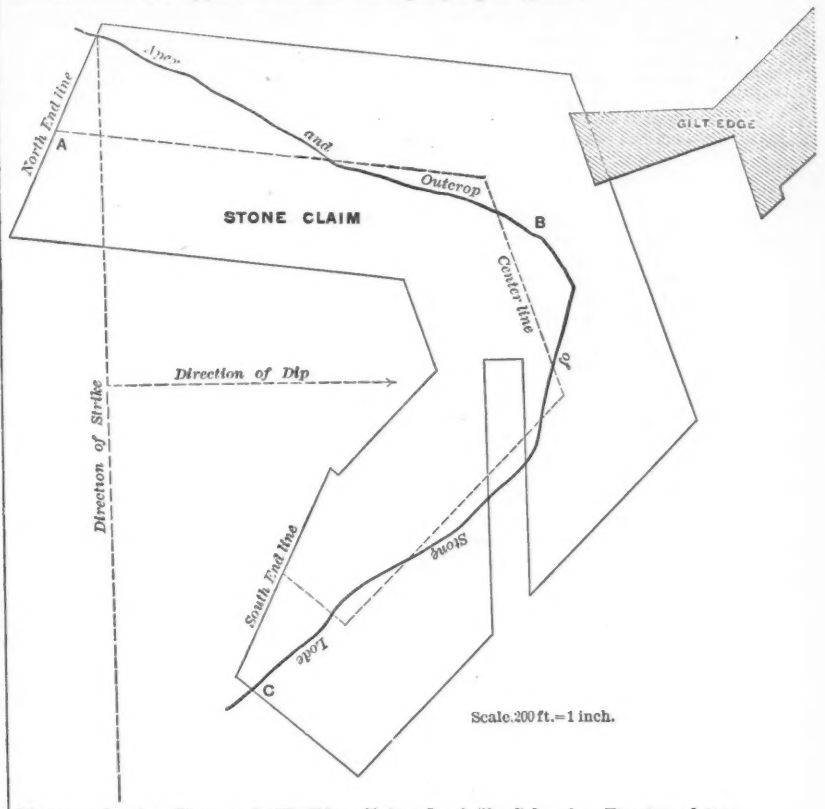


Diagram showing Stone and Gilt Edge Claims, Leadville, Colorado. The top of the diagram is nearly north.

The Stone location follows the outcrop of the vein around an apparent bend, produced by the erosion of the surface. In other words, though the true course of the vein is uniform, the erosion of a cañon exposes the outcrop of the vein along one side of the cañon, across it, and along the other side. Hence the location, following (in accordance with the Flagstaff decision) the surface outcrop, is not, and could not be, a parallelogram, but has the form of a horse-shoe. To comply with the letter of the statute, two end-lines were arbitrarily made parallel in the survey; but one of these (the southern one) is not strictly an end-line, and the direction of both is such that vertical planes drawn through them would not inclose the Gilt Edge ground in controversy.

On the other hand, there is no doubt that the Stone location contains the apex of that part of the Stone ledge which constituted the ground in controversy. That is to say, if the surface course of the vein be ignored, and its true course and dip be taken, and if vertical planes be drawn across the vein, at right angles to its course, at the points where it leaves the Stone location at the two ends, those planes would include the whole ground in controversy. But they would not coincide with the existing end-lines of the claim.

The Iron Company urged that the end-lines of its Stone location should be drawn by the court, not as they had been drawn by the surveyor, but as the spirit of the law required, namely, across the general course of the vein; and this vein is adopted by Chief-Justice Waite, who says: "The end-lines are not necessarily those which are marked on the map as such, but they may be projected at the extreme points where the apex leaves the location as marked on the surface." In this opinion Justice Bradley concurs; but the majority of the court, in an able opinion, delivered April 26th, 1886, by Justice Field, take a different view. The precise point before the court was this: The Elgin Company, *et al.*, plaintiffs below, asserted title to the premises under a patent for the Gilt Edge claim. The defendants introduced a patent for the Stone claim, as shown in the diagram. The patent contains the following grant: . . .

In addition to this documentary evidence, the defendant offered to prove:

"1. That the Stone vein, lode, or ledge mentioned in the patent is a vein, lode, or ledge of rock in place bearing iron, lead, and silver in large quantities, and is valuable on account thereof.

"2. That the top, apex, and outcrop of the vein, lode, or ledge exist, and are found in the Stone surface claim through its entire extent from north to south between walls of rock in place, a limestone foot-wall, and a porphyry hanging-wall.

"3. That the true strike of the vein, lode, or ledge is north and south, and has a dip to the east at an angle of 15 degrees below the plane of the horizon.

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* From a paper on "Lode-Locations," by Dr. R. W. Raymond, presented at the Bethlehem Meeting of the American Institute of Mining Engineers, May, 1886. [See this JOURNAL, page 222, September 25th, 1886.]

"4. That the vein, lode, or ledge, on its dip within vertical planes drawn downward through the end-lines of the vein, lode, or ledge, so existing and found within the Stone surface mining claim, and continued in their own direction, namely, in the direction of the dip of the vein, lode, or ledge, passes through, out of, and beyond the east vertical side-line of the Stone surface claim and location into lands adjoining, to wit, into and under the said Gilt Edge surface claim.

"5. That while the defendant admits that underneath the surface of the Gilt Edge surface claim it has followed and mined in and upon the Stone vein, lode, or ledge, by reason of the facts and premises above set forth, it had a right so to do, and that it has not otherwise in any way interfered with said Gilt Edge claim, or any part thereof."

To which plaintiffs objected, on the ground that the proffered proof would not be a defense to the action nor tend to establish a defense thereto, and that, by reason of the surface form or shape of the Stone claim, its owners had no right under the laws of the United States, or otherwise, to follow the lode alleged to exist therein in its downward course beyond the lines of the claim and into plaintiffs' claim; and that no part of the Gilt Edge claim or the mineral or lode within it was within vertical planes drawn downward through the end-lines of the Stone claim and continued indefinitely in their own direction. The court sustained the objection and excluded the evidence offered, to which ruling the defendant excepted.

No other evidence being offered, the court below found the issues in favor of the plaintiffs, and judgment was entered accordingly. The appeal consequently presented but one question, Was the evidence offered by the defendants properly excluded? The opinion of the court was printed last week, page 222.

The importance of this opinion justifies the foregoing reproduction of it in full. Its chief points may be summarized as follows:

1. The end-lines of a claim, properly so called, are those which are crosswise of the general course of the vein on the surface. This was already declared in the Flagstaff decision.

2. If these lines are not parallel, then the locator, under the act of 1872 (which is the statute now in force), acquires no extra-lateral right whatever to any part of the lode.

3. The parallel end-lines are absolutely and unalterably conclusive of the boundaries of the extra-lateral right. It is not necessary that they be at right angles to the course of the lode. In the case represented by the diagram, I understand the court to declare substantially that if the apex of the lode, instead of crossing at C, had swerved a little farther west, so as to cross the "south end-line," that would have been a true end-line, and the Stone patent would have conveyed the right to the lode northeastward between the two projected end-lines; but it would not have conveyed the right to the extra-lateral portions of that part of the lode from B to C, and hence, not to the Gilt Edge ground. It is easy to see that in that case, the Stone claim would cut away northward under the claims of adjoining locators in that direction, precisely as the Sitting Bull claim on Custer Hill, Dakota, does. In the appendix to "The Law of the Apex" (*Transactions*, XII., 677), reviewing the decision of Judge Church, of Dakota, in the *Silver Terra* v. *Sitting Bull* case, and in the paper itself (*Ib.*, p. 437). I stated both sides of this end-line question, and intimated my expectation that the Supreme Court would decide it as it has now done. This decision overrules that of Judge Church.

In this connection, I would call attention to an acute and interesting letter from Prof. Norman T. Mason, of the University of Michigan, published in the ENGINEERING AND MINING JOURNAL, April 10th, 1886, and to my editorial reply in the same number. Professor Mason argues in favor of what might be called the judicial rectification of end-lines; that is, the requirement that the planes bounding the extra-lateral right shall intersect the lode on its true dip, and the judicial creation, when necessary, of new end-lines fulfilling that condition, which is the operation performed by Judge Church on the Sitting Bull claim. His argument is based on the Congressional history of the act of 1872, and on an ingenious analysis of its language. He also criticises my statement that the construction for which he contends would contravene the general usage of miners. In my reply, I met the special issues raised by these arguments, reiterating my former declaration that the proposed judicial rectification of end-lines seemed to contravene the express letter of the law, and certainly contravened the general usage of miners, and concluded by saying:

"The construction of the law advocated by our correspondent is desirable on many grounds, if it be practicable. Whether the letter of the law will permit it is doubtful; but the Supreme Court can take the letter which lower tribunals and commentators can not take; and if the Supreme Court should adopt this view, we should not be sorry, even though it might thereby disturb lines heretofore supposed to be settled. But the difficulties of the case are so great that the law itself ought to be changed to meet them."

I recognize with natural pleasure in the Elgin decision of the Supreme Court phrases and arguments which I had previously introduced into this discussion. But I am not specially concerned to claim credit for them. Since in "The Law of the Apex" I argued both sides of the question as exhaustively as I knew how, it was inevitable that a decision either way would practically repeat something that I had said. But the result has been, as to the controlling force of true end-lines, once drawn, what I expected it would be; and whatever hardships it involves must be added to the heavy general account already accumulated against the existing system. We know at least where we stand in one particular.

(TO BE CONCLUDED.)

Moving a Valuable Scientific Library.—The valuable collection of books and documents belonging to the New York Academy of Sciences has just been removed to the Columbia College Library, where it has been permanently deposited. The collection consists of 8000 volumes, and is extremely rich in complete files of scientific publications of all sorts issued in this country and abroad. The removal of the library to its present quarters brings it within reach of a much greater number of readers. The transfer was completed on Monday. The Academy, which now holds its meetings at Columbia College, will begin its regular Monday evening lectures in about two weeks.

THE MINING REGION OF EL ORO AND TLALPAJUAHUA, MEXICO.

Written for the Engineering and Mining Journal by A. E. Foote.

This, though one of the oldest mining regions of the country, has but recently awakened to renewed activity under the influence of American enterprise. It is reached readily, the comfortable cars of the Mexican National Railroad taking one to Tulpenango. Four miles over a good road brings us to El Oro. The development of the mine is due to General Frisbie, who is a leader in so many American enterprises in Mexico.

The El Oro mining property, like most of the known veins of Mexico, was first worked by a Spanish company. An English company that took hold of it about 1847 brought in very expensive machinery from Vera Cruz, and took out from $18,000 to $20,000 of bullion per week. It had weekly bull-fights for its miners, and otherwise managed so extravagantly that, when it had exhausted its $25 and $40 ore, it was compelled to stop. The great mass of low-grade ore still standing is estimated at 3,014,570 tons, worth $12 per ton.

The San Rafael vein is white quartz, carrying both free gold and silver, the latter being both ruby silver and argentiferous galena. It has been worked from the San Juan tunnel, where there is a railroad for mule cars.

The Descubridoras has a more cellular quartz, carrying streaks that average as much as $120 a ton. It is worked through the Providentia shaft, where the hoisting-cage and Cornish engine are located. All through the El Oro mine, there are good natural walls, and but little timbering is needed. Among other advantages are wood, $5 a cord, the best of brick and fire-clay, abundance of good water, and good building-stone; labor, from thirty-five to fifty cents a day, except such as is needed for machinery and places of trust. The railroad station is four miles distant, but this might be reduced to three miles. By building a tram-road six kilometers, at an expense of $25,000, the cost of the wood can be reduced to $3 a cord. The average monthly output last year was $14,450. The condition of the mine has steadily improved under Mr. J. C. Toomer's management. He believes that, with the tram-road and a 100-stamp mill, he could work the low-grade ores to great profit.

Four miles over the mountain lies the mining camp of Tlalpajuahua. The road, though very steep, thanks to the wise care of Mr. Kline, superintendent of the Conception mine, is in very good order. Taking hold of the Conception mine, about four years since, Mr. Klein has made this abandoned mine not only pay dividends, but is putting up a fine twenty-stamp mill from the profits. He is a thoroughly practical and experienced man, and his new mill will be the most conveniently and economically arranged of any in Mexico. He not only designed it himself, but made all the working drawings. The ore is mainly ruby silver and native silver, with some polybasite and argentite.

Adjoining the Conception mine, is the famous Borda, from which the records show that a 20 per cent tax was paid on $28,000,000, and that it was abandoned only on account of the revolutions.

On the same vein with the Conception mine, is the Azteca, which was worked from 1825 to 1828 by an English company, which took out a very large amount of bullion. None of the lodes in this region has ever been worked to more than a few hundred feet below the water. The principal means of removing water has been by carrying it out in skins on the backs of peons. On the Azteca, about two hundred years ago, forty-five men were buried alive in an open cut that was not properly braced. They had been taking out very rich ore. But it is impossible to get the superstitious natives to consent to work there any more. A few years ago, a miner did penetrate through a narrow hole to the place and brought out one of the skeletons. This crumbled to dust, and no one ventured in again.

There certainly is an immense amount of low-grade ore in sight, and the mine can be bought very low. In the near future, this will be a great mining camp.

Choke-Damp Disaster.—By the escape of the noxious vapor known as choke-damp, from the monster blast at the Lochfyneside quarries, Scotland, on the 25th ult., some sixty persons were overcome temporarily; a few others are in an extremely critical condition. Seven deaths have thus far resulted, including three Glasgow magistrates.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

GRANTED SEPTEMBER 21ST, 1886.

349,301. Submarine Tunnel. Charles H. Buckelew, Plainfield, New Jersey.
349,306. Regenerative Heating-Furnace. Hugh Ferguson, Pittsburg, Pa.
349,309. Coal-Conveying Apparatus. Charles W. Hunt, West New Brighton, Assignor to C. W. Hunt Company, New York City.
349,342. Compressor. Frederick Eibler, Cleveland, Ohio.
349,369. Petroleum and Gas-Engine. Johannes Spiel, Berlin, Germany.
349,409. Rock-Drill. Henry C. Sergeant, New York City.
349,414. Pan for Concentrating Sulphuric Acid. Karl J. Sundström, Rustic, New Jersey, Assignor of three fourths to Alfred de Castro, New York City.
349,419. Machine for Rolling Eye-Bars. Henry Aiken, Pittsburg, Pa.
349,422. Magnetic Separator. Charles O. Bartlett, Cleveland, Ohio.
349,442. Dry Ore Amalgamator and Separator. Otto Matzke, Gunnison, Colo.
349,464. Gas-Engine. Johannes Spiel, Berlin, Germany.
349,472. Underground Conduit. James C. Anderson, Highland Park, Ill.
349,489. Oscillating Gas-Meter. Anson F. Fisher, Chico, Cal., Assignor of two thirds to Allen Henry and A. M. Barley, same place.
349,504. Ore-Separator. Henry C. Krause, Lake Linden, Mich.
349,513. Method of and Apparatus for Cooling Furnace Bosh-Jackets. James L. McMichael, Glen Wilton, Va.
349,538. Hoisting Device. Lorenzo D. Spragg, Marion, Ohio.
349,544. Roll-Grinding Machine. Jesse Warrington, Indianapolis, Ind., Assignor of one half to the Nordyke & Marmon Company, same place.
349,551. Operating Lever for Pumping Machinery. Jerome Wheelock, Worcester, Mass.
349,560. Rock Drill Machine. Bror F. Bergh, New York City, Assignor, by mesne assignments, to the Standard Hand Rock-Drill Company, same place.
349,594. Hydraulic Air-Compressor. Warren S. Johnson, Whitewater, Assignor to the Johnson Electric Service Company, Milwaukee, Wis.
349,596. Apparatus for Casting Pipe. Alexander Kilpatrick, St. Louis, Mo.
349,613. Automatic Cut-Out for Electric Light Circuits. William Stanley, Jr., Great Barrington, Mass., Assignor to George Westinghouse, Jr., Pittsburg, Pa.
349,654. Electric Motor. Vincent E. Keegan, Boston, Mass.
349,675. Coal-Separator. Jabez Woolley, Sr., Evansville, Ind.

PERSONALS.

John Dickson Taylor, Treasurer of the Pennsylvania Railroad Company, died very suddenly September 25th, in the sixty-first year of his age. The immediate cause of death was angina pectoris.

Mr. Frederick G. Corning, the well-known mining engineer of this city, leaves next week for Colorado, Arizona, and Idaho, on professional business. He may be addressed through his office, No. 78 Broadway. Mr. Corning's recent articles in this JOURNAL have attracted great interest. We trust he will paint the glories of our own mining districts in the pictured words with which he has made us familiar with Bolivian scenery.

FURNACE, MILL, AND FACTORY.

The Lawrence Iron and Steel Company, Ironton, Ohio, has been incorporated, with a capital stock of $20,000.

The Forest City rolling-mill, in the southern part of Cleveland, Ohio, was destroyed by fire on the 25th ult. The mill, which is owned by William Clark & Co., of Pittsburg, had been idle for nearly two years. The loss is estimated at $30,000.

The works of the Chicago Smelting and Refining Company, at the corner of Fourth and Clark streets, were completely destroyed by fire about midnight, September 24th. The plant is almost a total wreck. The greater part of the machinery, which was valuable, was destroyed. The loss is from $15,000 to $20,000; insurance, if any, not stated.

It has been decided to add extensions to the new open-hearth furnace plant at Homestead, Pa., that will make the building 1000 feet long. The additions consist of a shear mill and an intermediate building for general purposes. The structure will contain 1000 tons of iron and will be the most complete of its kind in the State.

The Philadelphia *Record* says that the Ash and Iron-Works, in Maryland, are using foreign iron ore. They are under lease to the Pennsylvania Steel-Works, and are turning out Bessemer pig. The demand for foreign ore grows with the demand for Bessemer steels, which could not be profitably produced east of the Alleghanies if the ore had to be brought from Lake Superior mines.

The Springfield (Ill.) Iron Company has just added to its plant a Long & Allstatter punch, with a capacity of punching six holes through one inch thick steel splices. This permits the punching at one operation of splices for the new three-tie joints that most of the leading railroads are adopting, and will make the capacity for punching splice-bars probably the largest in the country.

We clip the following from the abstracts of reports of the judges of the Franklin Institute Exhibition of 1885–86 (Group, Metallurgical Processes and Products), in reference to the Waring pulverator, which was awarded the highest medal of its class: "For the pulverizing of ores, phosphates, rock, cement, etc., the judges consider it well calculated to sustain the maker's claims, and think it the best and most desirable machine now in use in respect to efficiency, economy of labor, with the minimum of wear."

LABOR AND WAGES.

The regular Wednesday shut-down of the mines throughout the coke regions was discontinued on the 29th ult., and the threatened strike averted.

All miners of the Northern Pacific Coal Company struck on the 25th ult., on account of Vice-President Ballet's order that employés should sign a contract forfeiting all pay due on the violation of any of the company's rules. The strikers are promised aid from Timberline, Mont., and it is thought that the difficulties at that point may be repeated at Sims, Dakota.

Chess, Cook & Co., nail manufacturers, Pittsburg, Pa., resumed work on the 27th ult. at the Amalgamated scale of wages. It is presumed that the twenty other firms who signed the scale will resume. About fifteen other firms are operating at a lower rate, and a combination between the union men and manufacturers for the purpose of driving non-union nails from the market is talked of.

A special dispatch to the Pittsburg *Chronicle Telegraph*, dated September 28th, says that about 150 out of 200 workmen employed by Carr & Crawley, proprietors of the Philadelphia Hardware and Malleable Iron-Works, at Ninth and Jefferson streets, are idle, owing to the strike of 53 molders. About 150 machinists, laborers, and miscellaneous hands are necessarily laid off, leaving 50 machinists and others at work.

COAL TRADE NOTES.

ALABAMA.

Pratt Mines.—The Birmingham *Age* says work on the coke-ovens of the Pratt mines is pushed with more than usual diligence. Fifty are now ready for use, and within ten days 110 will be done; 750 ovens are to be built. If this company puts up four furnaces, as has already been planned, this number of ovens, with existing contracts, will be necessary. The contract for cleaning off and preparing the furnace site has been let. The extension of the company's new road some six miles southwest, to reach the ore-beds, will now be pushed with rapidity. Captain Johns very recently took a trip to Cindora, in Walker County, and examined deposits of coal there. He found a vein five feet seven inches thick. He has no doubt of its excellent coking qualities. Several skillful miners are now at work there, and will get out fifteen tons of coal, which will be brought to Pratt Mines, and thoroughly tested in order to find out its coking qualities. If this test results satisfactorily, it will cause extensive mining operations to spring up there. This experiment is also thought to foreshadow important operations of another kind. As is well known, the Pratt Coal and Iron Company owns ores in Franklin County, on the Sheffield & Birmingham Railroad, about eighteen miles from Sheffield. It is said to be the intention to utilize these, and if this is so, this Walker County coal, if it make a good coke, can be used to smelt them. This would also seem to indicate that the company intends to establish furnaces at Sheffield.

GERMANY.

A dispatch from Essen announces that an explosion of fire-damp occurred in a coal-pit near Schalke, on the 24th ult., and that forty-five persons were killed and sixteen injured, eight of the latter being in a precarious condition.

IOWA.

The Hawkeye Coal and Mining Co., of Ottumwa, has been incorporated, with $250,000 capital stock. It has leased about 300 acres of land, fronting on about a mile of the Chicago, Milwaukee & St. Paul Railroad.

MONTANA.

S. T. Hauser, A. M. Holter, H. D. Hauser, and E. W. Toole incorporate as the Livingston Coke and Coal Company; capital, $250,000, in shares of $5.

PENNSYLVANIA.

ANTHRACITE.

A meeting of the inspectors of the anthracite and bituminous coal districts of the State has been held at Harrisburg, for the purpose of securing uniformity in the reports of the Inspectors to the Bureau of Statistics, and a regular form was adopted for use in all the districts. These reports are made by law to the Secretary of Internal Affairs.

A Philadelphia & Reading engine drawing an empty coal train met with an accident at Stony Creek, Pa., on the 25th ult. The bumper block became detached and, falling on the rails, wrecked a train of about twenty cars, which were smashed to splinters. The wreck is unfortunate because the company needs every car to take coal to tide-water. The track was blocked for three hours. It is stated that the company will soon issue orders to build 2000 coal cars.

The mammoth vein of coal has at last been found at Raven Run. It was struck at a depth of about eighty feet, and is supposed to be from thirty to thirty-five feet thick and a safe vein for miners to work.

Three gentlemen of Brownsville have applied for a patent on an automatic coal mining machine which, it is claimed, can cut a twenty-four foot room in a quarter of a working day. It is reported that $50,000 has been offered for the machine.

WASHINGTON.

The Tacoma Coke Company, whose mines are at Wilkeson, Pierce County, after experimenting for about two years to manufacture coke out of its coal, has begun the erection of forty ovens, ten of which are to be completed at once. This is the only coke manufactured on the Pacific coast, and is said to be of excellent quality. The mines are situated 25 miles from Tacoma, the coal found being from 5 to 15 feet in thickness. Specimens of the coal show it to contain from 53 to 56 per cent of fixed carbon, from 24 to 35 per cent of volatile matter, from 6 to 19 per cent of ash, and the remainder water. The coke will be shipped over the Cascade division of the Northern Pacific Railroad.

GAS AND OIL NOTES.

Exports of refined, crude, and naphtha from the following ports, from January 1st to September 29th:

	1886. Gallons.	1885. Gallons.
From Boston	4,085,642	6,886,220
Philadelphia	111,880,029	111,350,803
Baltimore	12,220,029	8,825,774
Perth Amboy	3,908,017	...
New York	286,050,202	280,278,477
Total exports	418,233,919	407,341,274

CALIFORNIA.

The use of petroleum fuel is extending. For a year or more past, the Southern Pacific Company has been using it on some of the ferry-boats with success. The petroleum is kept at a burning temperature by a pipe of hot steam running within the oil-conducting pipe. The oil reaching the furnace is thrown into spray, and burns with great fierceness. The oil is a refuse from the refinery, thick and black, not ignitable until heated to a high temperature. It is brought from Alameda to South Vallejo, and the steamer receives enough in five minutes to last all day. From 500 to 600 gallons are used each day.

EGYPT.

An engine specially constructed to use petroleum as fuel is successfully drawing trains on the railroad between Alexandria and Cairo. It is estimated that a yearly saving of $250,000 in the cost of fuel would be effected on this railroad by the substitution of petroleum for coal.

PENNSYLVANIA.

A tank containing 300 barrels of oil, together with a derrick and engine-house, were destroyed by fire September 24th, at the Port Nebo well, some four miles back of Sewickley. A natural gas pipe connected with the boilers filled with oil and was ignited, which was the origin of the fire. The property was owned by T. E. Summer. His loss is said to be $5000. John McCrea's loss on fruit trees, fences, etc., will be nearly $1000.

The Washington Natural Gas Company is drilling two new wells in the Hickory field, one of which is down 1400 feet and is expected to reach the gas sand early in next month. The other well is down 400 feet, and will be finished in about six weeks.

The Chartiers Valley Gas Company is taking up the original 10-inch main laid by it on the west side of Main street, West End, Pittsburg. The line is of wrought-iron with screw joints, and, as it is perfectly good, will be relaid. The consumers on Main street are supplied from the 20-inch main on the other side of the street.

The Manufacturers' Gas Company will begin laying pipe on Second avenue, in the Soho District, next Monday. The company has two gangs of men at work on the South Side, one at Twenty-fifth street and one at Thirty-first street, Pittsburg. The main line from the Canonsburg field is within three or four miles of the city limits at Mount Oliver, and it is the intention to close up within a few weeks. The river line will be aid soon after, when the company will be ready to supply mills on the South Side and in Soho.

The Bellevue Natural Gas Company, composed of the Guffey Brothers and others, is rapidly putting down a second well on the island, and will be ready to supply the Bellevue and Glenfield people about the first week in October. The pipe-laying is pushed vigorously by several gangs of men, and will be all connected up very soon. The first well on the island, which has been completed for some time, is flowing strongly, and the new one, which will be finished in a few weeks, promises well.

A dispatch from Rochester, Pa., says that, after months of negotiation, the Bridgewater Gas Company has bought the Phillipsburg Gas Company clean and clear as far as it has gone.

The Philadelphia Company is rebuilding, at Blairsville, the derrick and engine-house recently burned on the Sloan farm, near Snyder station, on the West Penn Railroad, which is believed to indicate that it expects to find gas.

GENERAL MINING NEWS.

The total shipments of ore from Ashland during the season of 1886, up to and including September 22d, were as follows:

GOGEBIC DISTRICT.			
Ashland	46,968	East Norrie	8,778
Aurora	63,293	Nimikon	1,776
Iron Chief	9,030	Odanah	6,632
Bessemer	4,726	Pabst	14,150
Brotherton	8,509	Puritan	7,102
Colby	186,102	Sunday Lake	6,777
Iron Chief No. 2	530	Superior	2,021
Iron King	16,400	Trimble	6,922
Ironton	12,579	Pewabic	55
Germania	12,777	Valley	1,304
Kakagon	11,240		
Montreal	1,954	Total ore from Ashland	518,831
Norrie	95,553		

ARIZONA.

Vulture.—A correspondent informs us that a half-interest in the Vulture mine has been bought by St. Louis capital. The history of this mine is well known among mining men, dating back for more than twenty years, and showing some brilliant and remarkable periods of production. It has a fine plant, including an eighty-stamp mill, crushing upward of 5000 tons of ore monthly, yielding a net profit of from $5000 to $7000 a month. With the present showing of better grade ore in the block of ground from the 300 to the 450 level, east, this profit will be increased, and St. Louis capitalists be handsomely rewarded for their enterprise and judgment. This is a good mine, and if the future sustains the past, St. Louis will have another "Granite Mountain."

CALIFORNIA.

Cleveland.—The clean-up for a twenty-six days run amounted to $3100. The prospects are improving, and an extra force of miners will be employed before many weeks.

Empire.—This mine, in Gold Valley District, ten miles from Sierra City, is owned by a San Francisco company, with E. D. Ayer as Superintendent. The mine drifts in about 300 feet. The lode averages eight feet in width, is a well-defined, true fissure-vein, and runs northeast and southwest, and dips 52 degrees. The ore will average from $40 to $50 a ton. An eighty-stamp mill will be erected next spring. A saw-mill is in course of construction.

Plymouth Consolidated.—An officer of this company, just returned from California and from a visit to the mine, furnishes us with the following:

"In company with two fellow-directors, I visited our property at Plymouth, in Amador County. We found every thing in perfect order, and the mine looking better than at any previous period in its history. The mills have been run with wonderful regularity. Every stamp is busy. The chlorination-works are treating the sulphurets at a cost of ten dollars a ton, against twenty-five dollars, the price formerly paid at an outside reduction-works. All the machinery is driven by water-power, no less than twenty-two water-wheels being required. Some of these are under high pressure—nearly six hundred feet of water. There is no mine in the United States so admirably equipped for efficient and economical work as the Plymouth. The mine has just been opened to the 1500-foot level, into which a tunnel has been run 100 feet. The superintendent says that it will be the best level the mine has had, with indications of another below still better. Most of the rock is taken from the upper levels, it being the policy of the company to exhaust them before working out the lower levels. On the 800, we have recently discovered an entirely new body of ore, of the same grade and of immense size. At one place, it is eighty feet wide, and appearances indicate that it extends upward several hundred feet, and in the opposite direction downward, indefinitely. The amount of ore developed is sufficient to keep the mills employed several years at the present rate of consumption. The mine is in better shape than ever before, and the prospects are brilliant. With so great a mass of ore in sight, the wisdom of adding forty stamps to the Pacific mill has been discussed by the directors. The next dividend will be paid October 5th, being the forty-first consecutive monthly dividend, and a total of $1,775,000."

BODIE DISTRICT.

Reports for the week ended the 19th inst.:

Bodie.—The north drift on the 620 is extended 22 feet in good ore. Stoping goes on from the 700 uprise in good ore. The north uprise from the 700 level is extended 13 feet in good ore. The south uprise from the 700 level is extended 23 feet, with bunches of ore in it.

Bulwer.—The south drift, 100 level, is extended 22 feet without any change. The north drift, same level, is extended nine feet. There are 22 inches of ore in this drift; yesterday's assay, $55.36. The south uprise from the 200 is extended 14 feet with good ore in it. The 300 drift has been cleaned out and retimbered 120 feet. The north drift, tunnel level, on the west streak of ore, is extended 12 feet in ore. The south drift, same level, on Stonewall ledge, is extended 14 feet in broken-up ledge matter. The north drift 400 is extended four feet in good ore. The uprise, same level, is extended eight feet in good ore. All connections will be made next week, so that they can get the ore to the tunnel level and mill without any extra expense, when they will begin to take out ore and send it to mill.

Dudley.—The south drift is extended 10 feet. The men are cleaning up and repairing the drift.

Mono.—Rich ore is taken out below the 700-foot level.

Standard Consolidated.—South drift, 300 level, advanced 20 feet. West drift, advanced 18 feet. North drift, advanced 12 feet. West south drift, 400 level, advanced 10 feet. Winze, same level, advanced 18 feet. Uprise, advanced 12 feet. The south drift, 1000 level, advanced 8 feet. Ore shipped to mill for the week, 292 tons. The mill runs steadily to the full capacity of the force. A bullion shipment was made on Wednesday, the 15th.

COLORADO.

From the Leadville *Herald-Democrat* we take the following:

The interest in the Elkhorn gold discoveries increases. There are at the new camp at present about 200 men, the number being daily added to. Many who own prospects are making preparations to sink on their claims.

Mr. G. A. Holmes, of Danbury, Connecticut, is expected at Leadville in a few days to erect an electric plant to supply power to the mines. The first plant is designed as an experiment.

Adams.—The Adams shaft, on the Yankee Hill portion of the Adams Company's property, has lately disclosed some good-sized bunches of galena ore. There is no doubt now that there is a large body of ore at depth, contiguous to the new shaft. The occurrence of ore increases as work advances. The mineral is a carbonate and galena, assaying 12 ounces of silver and 46·5 per cent in lead. A strike of great importance has also been made in the Brookland shaft of this company. This shaft has encountered the second contact or lower zone, and found it prolific in mineral. This new strike in the Brookland, however, disproves this theory. The Brookland shaft was originally sunk to a depth of 550 feet, where it passed through from six to ten feet of ore. In resuming work, the shaft passed through twenty-five feet of iron and contact matter, after which intrusive porphyry was encountered. This porphyry had a thickness of from fifty to sixty feet, beneath which a solid stratum of blue limestone was met. From fifteen to twenty feet of the lime was pierced, when the shaft entered a mass of fine-looking sulphide ore. This new ore-body has not been penetrated to sufficient depth to justify great predictions, and the value of the ore has not been ascertained; but the probabilities are, that the discovery will prove of value, and that a new bonanza has been added to Leadville. The ore-body disclosed in the Brookland shaft is said to be the eastern extension of the great ore-body in the Maid of Erin mine, with which every one is familiar. That it will stop with the Brookland is not reasonable, and there is some evidence to warrant the opinion that the Wolf Tone shaft will, with depth, disclose the same ore-chute. Two assays or samples of the ore from the very top of the body returned respectively 7·5 ounces in silver and 32·5 per cent in lead, and 16 ounces in silver and 71 per cent in lead. The mineral is a sulphide. The Henriett mine is now shipping over one hundred tons a day from this ore-chute.

A. Y.—This mine is considered by some to be one of the richest mines in this district; at least, as having more ore in sight than any other property.

Chrysolite.—The new Clark shaft on the Chrysolite is down 186 feet, being about forty feet below the first level. Connection has been made between the shaft and the old workings of the mine, and in a short time all the hoisting will be done through it. The production of the property has lately been confined almost entirely to the yield of the concentrating mill. The operation of this mill on dump material has proved quite satisfactory, but will soon have to be suspended on account of the cold weather.

Emmet.—Additional machinery has been placed on this shaft on the south slope of Carbonate Hill. The shaft has a depth of 118 feet, at which it encounters the contact. A drift then follows in the vein material to the northward 160 feet, at which point a winze has been sunk. This winze has a depth of forty feet, penetrating dolomite sand. It is thought that beneath this lime, sand ore will be found, as in certain Iron and Fryer Hill mines. Should ore be discovered in this property, work will be started up in a dozen or more properties on the south and west slopes of Carbonate Hill.

Genesee.—B. J. Smith, in connection with St. Louis parties, has taken a bond on this property.

Harrison.—This smelter is beginning to add to its accumulation of ore, and should soon be able to blow in a fourth furnace.

Henriett.—The production of this Carbonate Hill mine is steadily increasing.

Jay-Eye-See.—As near as can be learned, the Jay-Eye-See shaft, situated between Printer Boy and Rock hills, has at last encountered good ore. The mineral is met with in stringers and small seams, which may lead to good ore-bodies with greater depth. Assays of the material so far secured return 247 ounces in silver to the ton.

La Plata Mining and Smelting Company, Limited.—A scheme of reconstruction has been issued to the shareholders of this company, in voluntary liquidation. They are offered the privilege of applying for a similar number of shares in the new company—the New La Plata Mining and Smelting Company, Limited (credited with 17s. 6d. paid)—as they hold in the old company. The liability of 2s. 6d. a share is payable—6d. on application, 6d. three months after allotment, and 6d. nine months after application. It is not intended at present to call up the remainder. Transferees of old shares are entitled to the same privilege, but must lodge their transfers with the liquidator of the old company before they can apply for the new shares.

Lilian.—The recently reported new strike in the Florence mine, of the Lilian Company, exceeds expectations. The ore-body shows a thickness of over six feet, and has been cross-cut for over twelve feet. The mineral is of high grade, containing the silver as a sulphide with free gold.

New Pittsburg.—The leasing company that has a lease of the forty acres of ground owned by this company has made a contract to sink the Van Nordan shaft to the depth of 400 feet, in order to intersect the ore-borders developed in the Hayden shaft, and the workings of the ore of the Tip Top.

Norfolk.—The work of erecting stamps in the old Norfolk smelter is about completed, and a run on the gold ores will begin on the 1st of October.

Sierra Nevada.—Work has started up. The property is situated on the east slope of Iron Hill, adjoining the Colonel Sellers on the northeast. Operations will be conducted through the No. 3 shaft of the Colonel Sellers mine, from which workings extend to the Sierra Nevada. The No. 3 shaft has a depth of 390 feet, and an incline at ten feet from the bottom and eighty feet long, driven in a northeasterly direction, showing fair mineral in the property to be worked. It is the intention of the owners to temporarily work through the incline, and to sink the shaft to greater depth and drive a level to tap the ore-deposits in the northeastern dip.

Silver Cord.—This mine has produced this month about 400 tons of ore. The manager has been very successful in securing good persons to work the apparently exhausted portions of the mine.

DAKOTA.

Caledonia.—In his last report, the superintendent says: We began sinking the shaft for the 525-foot level on the 16th, and made six feet. We started up the entire mill on the same day with 35 stamps on caved ore in the old stopes, west vein, 200-foot level, and 25 stamps on ore from the west-vein old workings 300-foot level. The ore produced is of fair grade. For the week ended September 20th, the ore produced was 990 tons; 420 tons from caved-in 200 level, and 570 tons from the west vein, 300 level.

Iron Hill.—On the 20th September, four big bars came down from the mill, and on the 22d, four more

were delivered by Superintendent Millett to the Merchants' National. This last invoice of Iron Hill product weighed 3748·93 ounces, making the total shipment for the month to date 18,622·93 ounces, and a grand total of 271,159·73 ounces.

IDAHO.

CHARLES DICKENS.—We have had inquiries by cable regarding this property, which was recently placed on the English market, as stated in our issue of August 28th, and which was reported sold at sheriff's sale at Challis (see JOURNAL, August 7th.) Answers to our inquiry state that this property, properly equipped with hoisting and milling machinery, and the mine thoroughly opened, will make a paying one. Statements published show that the company has arranged to lease the Custer mill, near the company's property, in order that work may begin at once on the large quantities of ore now on the dumps. The mill will be started as soon as possession can be obtained, and the company expects then to begin regular shipments of bullion.

LUCKY BAR PLACER.—The statemen presented at the annual meeting, recently held at Hailey, shows that the disbursements since the organization of the company amounted to $7694.11. The heavy machinery rented last April, with the privilege of purchasing for $10,000 at any time, while it was good as far as it went, did not supply one half the quantity of water that it was guaranteed to pump. Other machinery would therefore have to be provided, which could be got to work at an expense of between $500 and $1000. As the company had already expended thrice the sum that at the start it had intended to invest, some months may elapse before this machinery can be secured. In the mean time, three or four men would be kept at work on the ground, washing gold by means of a hand-pump out of gravel taken from the forty or more prospect lodes made in various portions of the company's claims. In this way, the ground will, without expense, be thoroughly tested, the gold produced paying for the operations.

ILLINOIS.

A vein of mineral, seventy-four feet from the surface, has been discovered in West Galena adjoining the famous Comstock lead, from which $6,000,000 in mineral were taken. The new mine is nine feet wide and 600 feet long.

DIAMOND POINT MINING AND MILLING COMPANY.—This company has been organized at Chicago; capital stock, $2,500,000; incorporators, Isaac Turgoose, F. M. Barrett, and James C. Miller.

MEXICO.

SANTO DOMINGO.—Persons connected with this mine who have not paid their quota of expenditures in exploring and mining on this Batopilas property for the past year are notified to attend to this matter before October 5th. Payments are to be made at No. 319 Walnut street, Philadelphia.

The Mexican *Financier* reports the following:

The Department of Public Works has ordered that the same name shall not be given to two mines in the same mineral district.

It has been decided by the same department that water-falls claimed under the mining code for use in mining operations shall remain in possession of the claimant while the water is actually used for the purpose named in the denouncement.

The following mines have been denounced lately in the State of Sonora: La Bacanora, in the Aguajo District, by Messrs. Ladislao Ferra and partners; the Guadalupe, in the Tecoripa District, by Messrs. Pedro Rochin and partners; the La Fortuna, silver mine, near the Valley of Le Barranca, by Santos Encinas & Co.; the San José del Bajio mine, near the San Javier Mining District, by Messrs. Gabriel A. Robinson & Co.; and the Provincia mine, in the Ures District, by Mr. Diego Mendoza.

The mines of the Cieneguilla District, the oldest recorded mining property in the State of Chihuahua, are worked by a Boston company. They are largely developed, there being a number of shafts 400 feet deep. The ore left in the old workings runs about 25 ounces in silver, the richest ore having been extracted by the former Spanish owners. The undisturbed vein will run as high as 1700 ounces. The ore is taken out and stocked for the present.

In the course of a report by Mr. Jenner, late Secretary of the British Legation at the City of Mexico, the following statements are made: Deposits of tin are found in the State of Durango in large quantities. There can be no doubt whatever as to the importance of the beds, which are situated about forty miles from the mines of Coreto, in a somewhat inaccessible position. Besides these deposits, which extend over an extensive area, there are numerous others in different parts of the country. Copper, which has long been worked in Mexico, is found in abundance in many of the States; but hitherto it has chiefly been valued as an essential element of the sulphate of copper, which is an indispensable ingredient for the separation of silver from the ore by the patio or Mexican system. The mineral district of Santa Agueda in Lower California, contains copper in abundance; and the mines worked in 1874 gave 6000 tons, which it is calculated would, under proper circumstances, be the annual return. The richest mines in the country are said to be those of the State of Michoacan, near Santa Clara, which only require to be worked on a large scale and with modern appliances to give the most satisfactory results.

CONCEPCION.—All work has been suspended on this mine of Tlalpujuahua, and water is said to be gradually filling up the mine, covering the ores. If pumping is not soon begun, it will become a very expensive work to save the money already spent on this property. Mr. Rigby, of the Sombrerete mines, has been inspecting this property with the view of forming a strong syndicate to purchase and work the mine.

CONCORDIA.—A contract has been made with the Union Iron-Works of San Francisco for a first-class hoisting plant for the Rayos mining shaft of this company, in Guanajuato. The Rayos is one of the principal mines on the Veta Madre vein. The shaft is 1320 feet deep, with a normal depth of water of about 800 feet. The inflow of water during the rainy season is estimated at about 300 gallons a minute. The hoist is intended not only to unwater the mine, but to handle the ore to be taken out in future workings.

EL ORO.—This company continues to do well, getting especially good ores from the Consuelo mine. It is putting in an additional hoist for the purpose of extracting the ores in a more economical manner.

GUADALUPE.—The placers located in Aldama Canton or County, which enriched many of Chihuahua's prominent citizens in 1870 and 1871, a camp of 2500 people growing up there within two months after their discovery, are again coming to the front, some very rich quartz carrying native gold having recently been discovered above the old placers. In fact, the whole country carries gold, there being an area of at least twenty square leagues, anywhere in which tests show the presence of gold. There are three companies now operating in this field, one Mexican and two American.

SAN CARLOS.—These mines virtually constitute a mountain of ore, the entire mass being more or less mineralized and crossed with veins of still richer ore. The ores are galena, not very high grade, carrying only from $30 to $40 in silver to the ton, the great value of the property depending on the immense quantities that can be extracted. Four shafts have been sunk at various places thirty or forty feet, and several open cuts made to the same depth, all everywhere showing the same mass of ore. This is an entirely new mining property, never having been worked before.

SEIS SEÑORES.—This company, of Tlalpujuahua, has its new mill-house entirely finished. The machinery has arrived and is expected to be in operation by the middle of October.

SIERRA RICA.—These mines, in the State of Chihuahua, near Presidio, Texas, are worked by an American company formed by Mr. Juan Zubiran, a leading citizen of Chihuahua. The same company works the San Carlos mines, about thirty-five miles south of the former. At the Sierra Rica mines, a tunnel is cutting to meet the principal vein at some 870 feet from the surface. These are old Spanish mines, first discovered in 1828, and quite extensively worked at that time, one shaft being from 90 to 95 varas, or Mexican yards, deep, with several connecting drifts; but they were afterward abandoned on account of Indian troubles, and only comparatively recently re-denounced and reopened. There are a number of leads, from three to four feet wide, which unite to form one large vein. The development heretofore has been on these smaller leads, some of which carry free-milling and some smelting ores, running from $100 to $180 a ton, the richer ore having been extracted by the ancients. There are 600 or 700 tons of milling ore and a small amount of smelting ore at the mouth of the old shaft. When the main vein is reached, it will be determined whether the ores will be shipped out or a mill or a smelter, or both, erected at the mines. The ore in this vein, it is thought, will run much higher than in the veins already opened.

MICHIGAN.

On the 29th ult., three miners were buried under a mass of falling stone at the Winthrop mine, Ishpeming, and instantly killed.

IRON MINES.

The following statement, given by the Marquette *Mining Journal*, shows the amount of iron ore shipped from the ports of this district for the season of 1886, up to and including Wednesday, September 22d:

	Tons.
Marquette—Marquette District	657,561
St. Ignace— " "	50,865
Escanaba— " "	448,838
Menominee District	649,053
Grand total of lake shipments	1,806,327
Shipments of Pig-Iron.	
Pioneer furnace	4,980
Deer Lake furnace	925
Vulcan	9,154
	15,059

The gain over the shipments from the above ports during the same period in 1885 is 244,656 gross tons.

DEER LAKE.—About 3000 tons of ganister are to be shipped from this mine this fall, which will complete the season's work. This ganister, which is used in iron furnace linings, has given excellent satisfaction, and inquiries for the rock, for next season's delivery, are made.

DEXTER CONSOLIDATED.—This company, to which we referred last week, is getting the Dexter mine in shape for the resumption of mining. Work on the property was abandoned in 1884, after two year's operation, during which time 21,410 tons were taken out. The ore-deposit has a width of about sixteen feet, the ore being a hard hematite of medium grade. The mine is about two miles east of the Boston.

PERKINS.—This mine is producing from eight to ten cars of ore a day, with a force of about thirty men. The new hoisting plant is in use. The drums are Lane's patent, and are of the most improved make.

MINNESOTA.

During the season of 1886, including the week ended September 22d, there were shipped from Two Harbors 234,874 tons of ore from this company's mines.

MONTANA.

A Washington special says that Acting Secretary of the Interior Muldrow has ordered two more civil and criminal suits against agents of the Montana Improvement Company, W. B. Hammond, of Missoula, and W. E. Fenwick, who cut over 4,000,000 feet from government land. Agents of the department have found that the Montana Improvement Company has organized a miners' lumber company, as a disguise, and is cutting timber as actively as ever. All the assets of the old company have been assigned to the new company, to avoid execution in case the government succeeds in its prosecution pending in the Wyoming courts. The company non-suited the government in Montana on the ground that the company's place of business was in Wyoming. The agents also report that they have spent $25,000 in retaining the best lawyers in Montana, Dakota, and St. Paul for their defense, and boast that they have $75,000 more in bank ready for use if necessary. Assistant Land Commissioner Stockslager and Acting Secretary Muldrow both express confidence that the company can be brought to terms before long. All efforts at compromise have failed. The amount involved in the pending suit aggregates at the lowest estimate over $1,250,000. In the suits ordered now, it is directed that the lumber taken by Hammond and Fenwick be seized and sold.

HOPE.—The mill is running on twenty-five ounce rock, and saving 84 per cent of the assay value in the pans. The work of this mill for August was the best ever accredited a wet crushing mill in the territory. At the mine, the ore-reserves continue large, with additions daily. A new shaft, about 800 feet northwest of the present one, will be sunk on the Porter ground this fall. This will catch the ore-chute on its dip out of the adjoining or Potosi ground, at a depth of 800 feet. It will also assist materially in the exploration of ores, as the deposit increases in depth and extent as the main level proceeds east. The diamond drill will be set to work early in the spring,

to prospect the ground below the fourth fault. At this point, there was a square drop-off of about 250 feet. The Bi-metallic shaft is down 210 feet. The compressor will be set during the ensuing week. When ready for work, the Burleigh drills will sink the shaft deeper in six hours' work than the present three shifts of men can do in twenty-four. All of the timber is cut down and cleared off of the Blaine ground.

Italian Ditch Company.—This company has been incorporated to convey water from the Yellowstone along Clarke's Fork Bottom. Capital, $20,000, in $10 shares.

Minneapolis Mining and Smelting Company.—Incorporated with a capital of $16,000, in shares of $1 each.

Rapid Transit.—This company has been incorporated to purchase and operate the Silver Star, Belle, and Accident lode claims in Silver Star District. Capital, $1,000,000, in $10 shares.

Revenue.—This mine is said to have been purchased by Eastern parties for $200,000.

West Extension Boston & Montana.—This company has been incorporated with a capital of $200,000 in shares of $1.

West Granite.—Six new sets of timbers have been placed in the three-compartment shaft. All of the heavy work of the gallows frame is about completed and ready for setting up. The excavation for the engine and boiler-room is nearly ready for the machinery. When the building is finished and the hoist ready for work, the West Granite will have the largest and most complete hoisting-works in the territory outside of Butte. The main header is still in favorable vein matter, the ledge retaining its strong and promising features for the better. Water under a good head continues to flow from the hanging-wall side. General Manager Pardee returned home Saturday, and is pushing construction.

NEVADA.

Excelsior Water and Mining Company.—The suit of this company against J. P. Pierce is on trial before Judge Wilson, of San Francisco. The complaint, which was filed in October, 1883, states that the defendant was a director of the company, and voted for 19 dividends, which were declared between July 12th, 1877, and August 16th, 1878. These dividends aggregated $266,692, and, as it is claimed that there was no surplus profits, the money for their payment was taken from the capital stock; therefore the company brings suit for the total amount of the dividends, together with interest since the date of the first one, in all amounting to over $450,000.

Holmes.—All work was stopped at mine and mill on September 1st, to be resumed when a rise in silver takes place. This is official.

From the Virginia City *Chronicle* we take the following summary of operations during the week ended September 18th:

Alta.—On the 700 level, a north drift is advancing from the Lady Washington shaft along the foot-wall of the Woodville vein, and a south drift along the hanging-wall of the Keystone vein. These two veins come together in the form of a V, and measure 167 feet in width from wall to wall at the broadest point. The material inclosed is principally vein matter—a mixture of porphyry, quartz, clay slips, and ore-seams. The vein narrows at the point of contact between the Woodville and the Keystone.

Best & Belcher.—On the 600 level, a south drift started from west cross-cut No. 1 in the 12-foot quartz body was advanced 33 feet; total length, 33 feet. This drift continues in quartz giving low assays. East cross-cut No. 1 was extended 43 feet; total length, 245 feet. The face is in vein porphyry.

Chollar.—The south drift on the 3200 level is out 230 feet from the station. Its course is a little east of south, and it is skirting in its advance the hanging-wall of a belt of quartz. Where the quartz shoves out into the drift from the main vein, it shows stronger mineralization than on the levels above, giving assays ranging from $1 to $3 a ton. The diamond drill-hole on the 3100 level is in 140 feet east of the south lateral drift. The core shows a solid quartz formation, slightly mineralized. No indications of wet ground are visible on either level.

Consolidated California & Virginia.—During the past week, 1098 tons and 1055 pounds of ore were shipped to the Morgan mill. The average value of the ore milled during the week, according to assays from battery samples, was $21.33. Bullion of the assay value of $25,375.15 has been shipped to San Francisco since last statement.

Crown Point and Belcher.—A force of 70 men is employed in both mines. The shipping of ore to the Mexican and Santiago mills was resumed last Monday. The daily average is now 29 car-loads, containing 232 tons.

Hale & Norcross.—Operations on the 3200 level are concentrated in advancing the north drift and the east cross-cut north of the deep winze station.

Kentuck.—Weekly shipments of ore do not exceed 150 tons. Only five stamps can be run with the present head of water.

Mexican.—On the 700 level, the joint west cross-cut started at the Union south line was advanced 23 feet; total length, 142 feet.

Ophir.—On the 1300 level, the south drift from the Ophir shaft was advanced 33 feet; total length, 393 feet.

Osbiston Shaft.—The southwest drift on the 2500 level has been opened up and repaired for a distance of 350 feet.

Savage.—Daily shipments of 100 tons of ore extracted from the 600 level were made to the Eureka mill during the past week.

Sierra Nevada.—On the 520 level, east cross-cut No. 1, opposite west cross-cut No. 3, started from the north lateral drift, was advanced 60 feet; total length, 60 feet. The formation in the face is porphyry.

Union Consolidated.—On the 700 level, west cross-cut No. 1, started from the northwest drift from the Ophir shaft, was extended 22 feet; total length, 66 feet. The Mexican and Union joint west cross-cut was extended 23 feet; total length, 142 feet.

Utah.—They are cutting a station on the south side of the shaft 472 feet below the surface, which corresponds with the 520 level in the Sierra Nevada mine.

Yellow Jacket.—Ore-shipments foot up 960 tons for the week ended yesterday. When repairs now in progress at the Vivian mill are completed, the weekly output will be increased to 1100 tons.

NEW MEXICO.

We are advised officially that the Peacock Mining Company was organized September 15th, 1884, with a capital stock of $2,000,000, divided into 200,000 shares. The ore is a peacock copper, carrying gold and silver. The gross output of the mine has been $150,000. It has a fine concentration plant, which is doing excellent work. Since May, 1886, it has paid a monthly dividend of five cents a share, or $10,000 a month, and the management confidently expects to make extra dividends within the next sixty days. It may safely be listed as a regular dividend-paying stock.

TENNESSEE.

A few weeks since, says the Chattanooga *Times*, a wonderful mountain of slate was discovered on Abram's Creek, in Blount County, Tennessee, one and a half miles from the Little Tennessee River. This development of slate is said to be the most remarkable ever discovered in this country, and gentlemen who have carefully examined it stated that the mountain contains slate enough to supply the entire demand in the United States for a generation or more. It is in fact a solid wall of slate, illimitable in extent and of very superior quality. Several large specimens compare favorably with the very finest Virginia or Eastern slate, and in some respects are vastly superior. The Little Tennessee is navigable nine months in the year, and at comparatively trifling cost the slate can be brought to the river and transported to Chattanooga. The following gentlemen control the mine at present: Col. W. A. Hoskins, Fillmore Gibson, C. C. Ham, of Chattanooga, and Col. Pricherd and W. B. Lenoir, of Monroe County. A company will be formed at once to work the mine on an extensive scale, and Chattanooga will be made the head-quarters and distributing point. The slate can be brought there at such small cost that it will drive out wooden shingles.

UTAH.

The smelting-works of the McKay & Revolution Mining Company, in Little Cottonwood Cañon, are now ready to start one stack, and will reduce the ores from the company's property, also ores purchased by it in this market. The office at present will be with C. E. Pomeroy, Main street, Salt Lake City.

Marette.—The five-stamp gold quartz mill has made its first run, consisting of about twenty-five tons of ore, mostly of a poor quality, so as to get the machinery and copper plates in order. The Salt Lake City *Tribune* says that the gold brick was small, but a beauty. The ore is hauled fifteen miles to the mill. This distance can, it is said, be diminished by drilling an artesian well within five miles of the mill, at a point where indications favor the easy tapping of a good water vein.

Northern Spy.—This group consists of the Northern Spy, Carissa, Alabama, James Blaine, James Fisk, Ben Butler, and Orton. The main work is on the Spy and Carissa, while the other claims are side claims for protection and working ground. All have been patented. The Northern Spy is developed by a tunnel on the vein 1200 on the first level, being 600 feet each way, and at a depth of 100 feet below grass-roots. The vein averages from 12 to 15 feet in width. The second level is fifty lower, and has been driven 220 feet north and 120 feet south, but has not been stoped above, as is the case above the first level. On the 340-feet level, drifting has gone 40 feet north and 250 south. The property is so situated as to give ample dumpage and ore-houses, while it provides necessary buildings for the men, etc. Less than six years ago, the present owners purchased the property for $33,000, since which it has paid back the money and given some dividends. In that time, it has produced over $200,000 for its owners. At one time, 800 tons of picked ore was sold, which netted, after paying treatment and freight, an average of over $53 a ton. The vein is in lime, has good walls, almost perfectly vertical. The lead ores run high in silver; it carries but little copper, and goes about ten per cent the value of metal in gold.

Stormont.—At the River mill, every thing works smoothly. The average daily shipment of ore to the company mill was 39 tons, 36 tons being furnished by the Thompson.

MARKETS.

New York, Friday Evening, Oct. 1.

Silver.

Date.	London. Pence.	N. Y. Cents.	Date.	London. Pence.	N. Y. Cents.
Sept. 25.	44¼	96⅛	Sept. 29	44⅝	96⅞
27.	44⅜	96⅜	30	44⅝	97
28.	44⅜	96⅜	Oct. 1	44½	96¼

The market closes steady, with no new features.

The new silver certificates are apparently in favor, and heavy demands for them have already gone in.

Foreign Bank Statements.—The governors of the Bank of England, at their regular weekly meeting, made no change in the bank's minimum rate of discount, and it remains at 3½ per cent. During the week, the bank lost £207,000 bullion; and the proportion of its reserve to its liabilities was reduced from 48¼ to 41 per cent, against 36¾ per cent at the same time last year. The weekly statement of the Bank of France shows a loss of 3,100,000 francs gold and a gain of 1,720,000 francs silver.

Copper.—The continued stoppage of the Western mines and the steady and very large consumption are producing their legitimate effect in a very strong and advancing market. Lake copper may be quoted at 11¼@11⅜c., with a difficulty in getting it, which foreshadows 12 cents before the close of the year. Other brands are also very strong, and since the stoppage of the mines, if continued, means the stoppage of our copper smelting-works in the East by the end of next month, there is no desire to sell even at the advance asked.

Baltimore is still the lowest in the market, but Orford is asking 10¼@10¾c. for casting and Arizona grades respectively, and is very independent at these figures.

Chili Bars advanced during the week to £41 2s. 6d., but closed this evening in London at £40 17s. 6d. Best Selected, £44.

Scarcely have we commenced to see daylight ahead in the copper business than some one must come in with a cloud to shut out the light. It is true the cloud is much smaller than "a man's hand" as yet, and we are not much frightened—neither are the producers, none of whom is yet offering "futures" at any discount.

The report that appeared in our mining news last week is, that "a mountain" of copper has been found on the line of the Canadian Pacific Railroad near the Sault Ste. Marie, foot of Lake Superior.

To-day, a telegram was received in this city from

President Sir George Stevens, saying, "No exaggeration in published statements; deposits simply enormous."

It is not certain that Sir George Stevens understands any thing about copper ores, and his confirmation of "a mountain of copper" inclines us to think he does not.

The following are extracts from the copper report of Messrs. James Lewis & Son, dated Liverpool, September 16th:

Notwithstanding the large increase in the stock and visible supply of copper, together with full charters, the value of Chili Bars declined very slightly, £38 17s. 6d. being the lowest accepted for sharp cash. Both cash parcels and forward prompts continuing in active request, prices have gradually and steadily advanced to £40 2s. 6d. for cash and £40 15s. for three months prompt, these being the closing quotations. As the stoppage of production in Arizona amounts to about 1000 tons and in Montana to about 2500 tons a month, we may soon look for the effect of supplies being diminished to so large an extent as to be felt both here and in the United States. A parcel of Arizona ingot copper has been reshipped to New York. Furnace material is becoming very scarce. Nearly the whole of the present stock consists of Spanish precipitate, Chili regulus, and Anaconda matte, which are held for a considerable advance on current rates. Smelters will probably be obliged to supply their needs with Chili Bars ere long, in which case we may look for a further advance in them, the quantity of cash bars offering being but limited, notwithstanding the large stock.

The Chili charters for the first half of this month are not yet advised, but the exchange is quoted at 22½d.

The arrivals in Liverpool and Swansea from Chili have been 1090 tons, and from the United States 128 tons bars, 25 ingots, and 974 matte, equal to about 755 tons fine here, and 510 tons fine in France.

Quotations to-day are: Chili Bars of g.o.b.'s, £40 2s. 6. to £40 5s. for sharp cash, and £40 15s. for three months prompt. Ore of 25 per cent, 7s. 3d. to 7s. 6d. Montana matte and Chili regulus, 7s. 9d. to 8s. a unit.

STOCKS.		Tons fine.	Tons on 1st inst
Chilian	in Liverpool and Swansea..	39,976	40,354
	France	918	693
American,	Liverpool	2,265	1,795
	France	235	175
Sundries,	Liverpool and Swansea..	3,689	3,893
	London	7,752	7,370
	France	40	....
		54,875	54,280
Afloat as advised by mail and cable to date:			
From Chili		*0,322	10,923
	Australia	900	900
Total visible supply		*65,097	66,103

*This does not include the charters now due.

Tin.—This market is quite strong and active, and some 350 tons were sold at the Metal Exchange at from 22·50@22·65c. for October, and 22·40c. for Spot.

London cables the price to-day £102 10s. for Spot, and £103 5s. for three months.

Lead.—There is no improvement in this metal; on the contrary, as our report a week ago prepared our readers to learn, the market has declined still further. There are very conflicting statements in the market—on the one hand, that manufacturers have aken a good deal of lead during the week at 4·50c.; while, on the other hand, it is certain that about 150 tons have changed hands at 4·45c., and there is even a rumor that it has been offered at 4·40c. Sales are reported aggregating perhaps 800 tons, the greater part of which was at 4·50c. The St. Louis market stands 4·30c., or a parity of 4·57½c. here, and there appears to be no pressure to sell.

Perhaps the most serious feature of the market here is the large stock of lead on hand. Of foreign, it is said there are 3200 tons, and of domestic nearly 3000 tons, of which nearly a half is Richmond lead. Manufacturers are also heavily stocked, holding, perhaps, 1500 tons more. It is also asserted that stocks are accumulating West; but this can not be to any serious extent. The chief causes of this dullness are the continued dullness in the white lead business, which it is said will take 10,000 tons less of lead this year than last; the plumbers' strike, which has greatly interfered with the market; and the large importation of foreign lead.

As we stated a week ago, the market is in an unsatisfactory condition; and unless a better demand springs up, we need not be surprised if lower prices yet be reached.

Spanish lead in London to-day, £12 17s. 6d.

Spelter.—There is nothing worthy of note in this market. The price continues at 4·30@4·50c. for Domestic, according to brand; New Jersey, 6@6¼c.; Bergenport Lehigh, 8¾c.

Foreign Spelter may be quoted 4·65@4·70c.

Sheet-Zinc—We quote at 5·60@5¾c.

New Jersey Zinc Oxide is quoted 3¾@4¼c.

Cables to the Metal Exchange to-day quote Silesian in London £13 12s. 6d.

Antimony.—We quote Cookson's at 9@9⅛c. Hallett's has remained at from 7½@7¾c. It continues to be quoted in London at £30.

Nickel.—We quote 60@70c. nominal.

Bismuth—Is quoted at $2@$2.25 a pound.

Aluminium—Is quoted at $1 an ounce.

Old Metals.—The purchasing prices offered by dealers are as follows:

Heavy copper	6c.	per lb.
Light copper	5c.	"
Copper bottoms	5c.	"
Brass, heavy	5c.	"
Brass, light	4c.	"
Composition, heavy	7c.	"
Lead, heavy	4¼c.	"
Tea lead	3¾c.	"
Zinc	3¼c.	"
Light iron	$9.00	per ton.
Stove plate iron	9.00	"
Machinery iron	14.00	"
Grate-bars	6.00	"
White No. 1	3¾c.	per lb.
White No. 2	1¾c.	"

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Oct. 1.

Iron Ore.—The following are standard prices of Lake ores at Cleveland, but our Pittsburg correspondent reports purchases below them:

No. 1 Specular and Magnetic Bessemer ores, per ton	$6.00@6.25
No. 1 Specular (non-Bessemer) ores, per ton	5.00@5.50
Bessemer Hematites	5.00@5.50
Non-Bessemer Hematites	4.00@4.50
Gogebic Range ores	4.75@5.25

Freights from Escanaba, $1.50@$1.60 a ton; Marquette, $1.85; and Ashland, it is said that from to $2.25 is paid.

New York prices for foreign ores are from 8⅛@9⅛ cents a unit.

The principal foreign ores imported, with their percentages of iron and phosphorus, made as the basis of purchase for the furnaces of Cooper & Hewitt, are as follows:

	Iron. Per cent.	Phosphorus. Per cent.
Porman (Spain)	0·52	0·025
Elba	0·55 to 0·64	0 011 to 0 022
Mokta (Africa)	0·62	0 02
Tafna (Africa)	0·56	0·04
Camarata (Africa)	0·58	0·018
Seriphos (Greece)	0·52	0 033
Belfast (Ireland)	0·46	trace
Lisbon (Portugal)	0·57	0·01

The experience with the Greek ore imports has been unfavorable on account of the trickiness of the shippers.

American Pig.—The reports from every part of the country indicate a strong and advancing iron market. The principal furnaces are sold up and are out of the market for the rest of this year, and all are unwilling to make engagements for 1887. The impression is growing that prices will be higher next year, and prices have already advanced here. We quote standard Lehigh brands, tide-water delivery: No. 1 X, Foundry, $18.50@$19.50; No. 2 X, Foundry, $17.50@$18.50; Gray Forge, $16.50@$17.50; while less popular brands sell 50 cents below these figures, and fancy brands, such as Chickies, Sheridan, McKees, and others, sell at $20.50.

Scotch Pig.—The market is firm and prices still have an upward tendency, following the advance in Glasgow and higher freights. We quote: Coltness, $20.50; Gartsherrie, $19.75; Summerlee, $20; Dalmellington, $19.25; Langloan, $19.50; Clyde, $19.50; Glengarnock, $19; Eglinton, $18.50. Cables to the Metal Exchange to-day quote: Coltness, 50s.; Summerlee, 45s. 6d.; Langloan, 45s.; Gartsherrie, 45s. 6d.; Glengarnock, 42s. 6d.; Dalmellington, 41s. 6d.; Eglinton, 41s.: Warrants, 40s. 9d.; Middlesboro', No. 3, 30s. 6d. Freights are 6@7s.

Bessemer Pig.—Domestic Pig is quoted at $18.75@$19 at the furnace, and Foreign, ex ship, $20, nominal.

Spiegeleisen.—We quote English, $26@$26.25, and German, $25.25 for 20 per cent.

Structural Iron and Steel.—There is an active demand, owing to the activity throughout the country in railroad building. The greater facility with which railroad companies can raise money is enabling them to replace wooden bridges by iron, and to make other improvements long delayed. We quote: Angles, 2@2·20c. delivered; Tees, 2·50@2·55c.; Iron Beams and Channels, 3c. base, for American; Steel Angles, 2·40@2·50c.

Steel Rails.—Prices are simply nominal at $35, at Eastern mills, but it is impossible to place an order for early delivery. Cables to-day state that John Cockerill & Co., of Seraing, Belgium, have offered a German road 5000 tons of rails at 101 marks, say $25, a ton. This offer was from 3 to 6 marks below those of German mills. Important sales of Foreign rails have again been made for delivery at Gulf ports, at $37@$37.50.

Steel Plates.—The market is firm and a fair business doing. We quote for Tank, 2·60@2·70c.; for Boiler and Ship Plates, 3@3¼c.; for Flanges, 3½c.; for Extra Flange and Fire-Box Plate, 4@4½c.

Steel Blooms and Billets.—We quote Blooms, in the absence of sales, $27 for foreign. We hear of sales of several thousand tons of Billets, and quote $27.50@$28.50, according to size and quality.

Merchant Steel.—Our quotations remain as follows: American Tool Steel, 7½@10c.; special qualities, 11@20c.; Crucible Machinery, 4@4·50c.; Bessemer and Open-Hearth Machinery, 2½c.

Plate Iron.—Common Tank, 2@2¼c.; Refined, 2¼@2⅝c.; Flange Iron, 3¼@3½c.; Extra Flange, 4@4·25c.

Cast-Iron Pipe.—We quote $32.50 a ton for 4-inch pipe; $31.50 for 6-inch; and $28.50 for 48-inch, at the foundry.

Scrap.—The market is quiet. We hear of some sales, and $19 has been reported as the price obtained for a common lot. We quote $19.50@$20.50 for Wrought, and $13@$14 for Cast.

Rail Fastenings.—We quote Spikes, 2·25@2·35c. a pound; and 1¾@2c. for Angle Fish-Bars; 2·50c@3c. for Bolts and Nuts. Sales in the East are reported 1·75c. for a large lot of fish-bars.

Bar Iron.—The market is firm and demand good. We quote: Refined at 1·70@1·90c.; Common, 1·60@1·70c. Store prices are ·10@·20c. higher.

Philadelphia. Sept 30.

[From our Special Correspondent.]

The sales since Monday have been, in foundry, mostly for from 25 to 100-ton lots, and in forge from 100 to 250-ton lots. Inquiries have been presented for 500 and 1000-ton lots, and one or two large companies are credited with having entered into arrangements for exceptionally large deliveries, in consideration of slight concessions. On all ordinary business, there is no weakening, rather the reverse. Matters are arranging themselves for an advance, especially on standard and special brands of forge iron, which even this week are rather scarce. Business is done at $16 and $16.25. No. 1 Foundry, at $18@$19, and No. 2 mostly at $17.

Muck-Bars.—Prices jumped to nominally $31@$32, but outside of a small lot or two, it is hardly fair to quote such prices as the standard market quotations.

Blooms.—Charcoal and anthracite blooms are quiet and without particular movement.

Foreign Material.—No business has been reported.

Manufactured Iron.—Prices are firm and advancing, and demand in excess of mill capacity for immediate delivery or within thirty days. Medium iron sold to day at 1·75@1 80c.

Nails.—Nails are $2.10 and active.

Plate and Tank.—Plate iron has moved up a tenth all around, on small lots especially. Slight concessions are still to be had on late deliveries.

Sheet-Iron.—All manufacturers report an active demand and card rates obtainable on prompt deliveries.

Structural Iron.—A large amount of business has been sent to the mills this week. Prices are strong and plenty of business offering. Angle, 2·10@2·11c.; Beams and Channels, 3c.

Skelp.—Skelp is firm at 2 05@1·90c.

Wrought-Iron Pipe.—It is said another improvement in prices is contemplated. There is much urgent business offering in the way of pipes and tubes.

Steel Rails.—In the aggregate, the week's business for early winter delivery is light, unless two or three

large pending negotiations should go through before Saturday. Quotations: $34 at mill for late and $35 @$36 for earlier.

Old Rails.—About 2000 tons have been ordered for shipment at $21.50, with $22 asked. Spot lots are hard to get.

Scrap.—There is great activity in Scrap, and selected lots are picked up at $20@$21.

Pittsburg. Sept. 30.

[From our Special Correspondent.]

We report a firm and steady market. The sales of raw iron since our last have been large. Prices are well sustained. Trade has certainly gained strength. Sellers are decidedly more independent, and less disposed to talk about concessions or even listen to them. In regard to values, manufacturers are indisposed to put prices any higher than absolutely necessary. In most quarters, there is more anxiety for a winter's business than for wider margins. Manufacturers and others are schooling themselves in the transaction of a large business with small profit, that they may accomplish what they formerly did in transacting a comparatively small business with large profits. One of our leading iron brokers refused last week's prices for 1000 tons Gray Forge iron. From this it is pretty evident it would be difficult to place orders as favorably as a week or ten days ago, notwithstanding the fact of the present production of pig-iron being the greatest on record. The supply of Southern unknown and low grades has fallen off considerably, and buyers have to do the traveling. Transactions since our last have been extensive: 1000 tons Gray Forge Lake ore, $15.50 cash; 2000 tons, $15.75 4 mos.; 1500 tons Bessemer, $18 cash; 1000 tons Gray Forge, $15.25 cash; 500 tons Gray Forge, $15.75 4 mos.; 300 tons Bessemer, $18.50 cash; 500 tons No. 3 Foundry, $16 cash.

Muck-Bar.—400 tons $27 50 cash; 400 tons, $28 cash.

Old Rails.—1000 tons, $24 cash. All descriptions of raw material very firm.

Pig-Iron.—Following are the current rates:

	$	$		$	$
Coke or bituminous:			Muck-Bar	27.50	@28.00
Foundry No. 1	17.25	@17.75	Steel Blooms	30.00	@36.00
Foundry No. 2	16.25	@16 75	Steel Slabs	29.00	@33.00
Gray F., No. 3	15.25	@16.00	Steel Crop Ends	22.00	@ .....
" " No. 4	14.50	@14.75	St'l Bl'm Ends	21.00	@ .....
White	14.50	@15 00	Old Iron Rails	23.50	@24.00
Mottled	15.00	@15.50	Old Steel Rails	23 00	@23.50
Silvery	15.50	@18.50	No. 1 W. Scrap	17.50	@18.00
Bessemer	18.00	@18.50	No. 2 W. Scrap	16 50	@17.00
Charcoal:			Steel Rails	36.00	@36.50
Foundry No. 1	21.50	@22.00	" light sect's	37.00	@40.00
Foundry No. 2	20.00	@20.50	Bar Iron	1.70	@ 1.75
Cold-Blast	23.00	@25.00	Iron Nails	2.10	@ 2.20
Warm-Blast	19.00	@23.00	Steel Nails	2.05	@ 2.10
20 p. c. Spiegel	27.50	@			

LATEST IRON SALES.

Coke and Coal Smelted Lake Ore.

1000 tons Gray Forge ..... $15.62 cash.
200 " No. 1 Foundry ..... 17.75 cash.
100 " Bessemer ..... 18.50 cash.

Coke, Native Ore.

300 tons Gray Forge ..... $15.00 cash.
100 " Gray Forge ..... 16.00 4 mos.

Charcoal.

50 tons Cold Blast ..... $25.00 cash.

Old Iron Rails.

700 tons old rails ..... $23.00 cash.
500 " " " ..... 23.50 cash.

COAL TRADE REVIEW.

New York, Friday Evening, Oct. 1.

Statistics.

Production Anthracite Coal for week ended September 25th, and year from January 1st:

Tons of 2240 lbs.	1886. Week.	1886. Year.	1885. Week.	1885. Year.
P. & Read. RR. Co.	289,505	8,141,972	271,313	7,936 966
L. V. RR. Co.	153,565	4,366.633	156,783	4,123,315
D. L. & W. RR. Co.	125 3?9	3,527,279	122,622	3,351,135
D., & H. Canal Co.	81,774	2.570,350	98,544	2,263 652
Penna. RR.	53,747	2.272.585	62,0 9	2,329,689
Penna. Coal Co	33,965	965,454	41,79?	950.456
Penna. Canal Co.	13,081	326.142	16,631	295,644
Total	751.026	22,170,420	770,313	21,250,857
Increase		919,563		
Decrease	19,287			

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1881 ..... 20,422,349 | 1883 ..... 22,997.226
1882 ..... 21,027,176 | 1884 22,350,384

The Norfolk & Western Railroad Company reports shipments of Pocahontas Flat-Top coal for the week ended September 25th, 1886, and year from January 1st, as follows, tons of 2000 pounds: 1886, week, 15,383; year, 82,203; 1885, week, 11,854; year, 390,599. Increase, 886, week, 3,529; increase, year, 191,604.

The report of the total output of coal from the mines on the line of the Chesapeake & Ohio Railroad for the week ended September 14th, 1886, and year from January 1st, is as follows: 1886, week, 25,975 tons; year, 845,033 tons; 1885, week, 21,854 tons; year, 766,682 tons. Increase, 1886, week, 4121; year, 78,351 tons.

Production Bituminous Coal for week ended September 25th, and year from January 1st:

Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1886. Week.	1886. Year.	1885. Week.	1885. Year.
Phila. & Erie RR.	.....	7.840	18	21.159
*Cumberland, Md.	70,360	1,679,464	62.19?	2,019,852
Barclay, Pa.	2,638	138,897	5,208	175,431
Broad Top, Pa.				
H. & Broad Top RR.	6,269	277,083	.....	109,377
East Broad Top	.....	.....	.....	.....
Clearfield Region, Pa.				
Snow Shoe	2,282	75,688	2,332	104,195
Karthaus (Keating)	3,826	98,432	2 864	90,162
Tyrone & Clearfield	51.535	1,529,251	48,557	2,116,326
Alleghany Region, Pa.				
Gallitzin & Mountain	13,254	496,500	9.328	381.541
Total	150,164	4,393,155	130,319	5,918.043

* Tons of 2240 lbs.

WESTERN SHIPMENTS.

Pittsburg Region, Pa.				
West Penn RR.	2,717	238,246	3,529	164,719
SouthwestPenn.RR.	811	125.305	2.238	73,815
Pennsylvania RR	6 541	197.729	7,012	156,039
Westmoreland Region, Pa.				
Pennsylvania RR.	36,242	856,414	27.228	876,037
Monongahela Region, Pa.				
Pennsylvania RR.	8,810	289,022	4,501	199,626
Total	55,121	1,706,716	44,508	1,470,236
Grand total	205,285	6,099,871	174,827	6,488 279

Production of Coke on line of Pennsylvania RR. for week ended September 25th, and year from January 1st:

Tons of 2000 pounds.

	1886. Week	1886. Year.	1885. Week.	1885. Year
Allegheny Region.	3,992	134,878	4.174	133,907
West Penn. RR.	1,863	77.850	1,500	35,149
Southwest Penn. RR	48,938	1,906.980	27.642	1,321,310
Penn. & W. Region	5,864	239 034	5,728	171,395
Monongahela	2,260	103,543	2,021	69,644
Pittsburg Region	..	1?	.....	.....
Snow-Shoe	778	19,250	1,101	13,410
Total	63,695	2,481,550	42,166	1,754,815

Anthracite.

The anthracite coal trade continues in as fine condition as we ever saw it. The demand is large, and the supply is limited to the wants of the market. The result is, that full and profitable prices are received. Both the demand and prices will unquestionably increase during the next sixty days, while an unusually good and profitable trade is expected for the next six months.

The sales-agents are genial gentlemen with good tempers and a very thorough knowledge of the coal trade. They are handling the business with much more wisdom than has heretofore been shown. If the directors of the companies will recognize this, and in the future intrust all questions bearing upon the regulation of the trade to the sales-agents, the stockholders may expect much better returns on their investments than they have had for years past.

At a meeting of the sales-agents yesterday, Broken coal was advanced 5 cents a ton, Egg and Chestnut 10 cents, and Stove 15 cents, making the present circular prices as follows:

Broken	$3.55	Stove	$4.10
Egg	3.80	Chestnut	3.65

It is recognized as unwise to advance prices much more for two reasons, first, because it would reduce consumption, and secondly, because it would be a very unpopular movement. A gentleman prominent in the regulation of the trade thinks that the following will be maximum prices: Stove, $4.25; Chestnut, $3.90; Egg, $3.90; Broken, $3.70. This, upon the basis of the Lackawanna averages, would probably give, he says, between $3.70 and $3.80 a ton, or a little more than $1 a ton above the lowest Lackawanna average this year.

Some friction has been caused by the action of the Pennsylvania Coal Company in making the following prices *before* the meeting had issued the new rates: Lump and Grate, $3.45; Egg, $3.65; Stove, $4.05; Chestnut, $3.70; Pea, $2.30. These prices are at Newburg, and "contractors" are allowed 20 cents off them.

We continue to advise purchases of coal, because prices are going higher, and it will be very difficult to get coal with dispatch in a few weeks.

There is said to be a large amount of coal required east of Cape Cod.

The Lehigh Valley Railroad advanced tolls 10 cents a ton yesterday.

We quote ordinary free-burning coal, net, f.o.b., as follows:

	Week ended Oct. 1.	Sept. 24.	Sept 17.
Lump	$3.40	$3.35	$3.35 .....
Steamboat	3.40	3.35	3.35 ...
Broken	3.40	3.35	3.35 ...
Egg	3 65	3 55	3.55 ...
Stove	4.00	3.85	3.85 ...
Chestnut	3.50	3.35@3.40	3 35@3.40
Pea	2.10@2.30	2.10@2.25	2 00@2.10
Buckwheat	1.60@1.75	1.60@1 70	1.60 .....
Dust	1.35	1.35 . ..	1.35 .....

Bituminous.

There is more inquiry for this coal, and a scarcity of it as well as of cars. The new line of steamers between this city and Cuba and Mexico made a contract for Clearfield coal this week. Prices in some instances are ridiculously low. This is due to a dog-in-the-manger disposition among a large proportion of the managers in this trade. When they find that they can not get orders, they put in bids so low that their competitors can make but little if any profit. The result is, that the entire trade is unprofitable.

How the managers of the bituminous coal trade can look upon the successful manner in which the anthracite trade is now managed, and not accept the suggestion that the petty business of the bituminous mines can be made profitable by honest co-operation, we can not see. Of course, the railroad managers are to blame to some extent. If all shippers were treated alike, and they had entire confidence that the railroads were not making special concessions, things would go much more smoothly; but as the shippers are never certain in their position or tolls, as compared with their competitors, they are unable to do business with that confidence in the value of an article that every business man should have. However, the bituminous managers do so little to improve their own condition, and so much to accomplish their own ruin, that they receive but very little of our sympathy.

Buffalo. Sept. 30.

[From our Special Correspondent].

The Natural Gas Fuel Company has issued its schedule of rates. It appears that seventy-five cents per thousand cubic feet will be the cost, inclusive of the charges for connection with the main and meter; but each householder will have to pay for the pipes, etc., from curbstone to stove or furnace. It is understood that a considerable rebate will have to be allowed from the above figures, as no one will take the gas fuel at them; but the company by its grant is bound to publish the highest limit of prices, as no increase from the said highest limit could be allowed.

The anthracite and bituminous coal market has presented no new features worth recording. It is expected that the price of the former, after the action in New York on the 29th, will be advanced at retail to-morrow or Monday at latest. There are still loud complaints of short supply of cars, but the quiet ones say that the evil is only temporary, being caused by every body wanting his coal at once, having stood off all summer for "bear" developments.

Coke is quiet and unchanged in price; at any rate, an average trade being done for local requirements.

"There is no longer any question that there is a good demand for coal," says a dealer, "but the demand for cars to transport it can not be filled by a large percentage. Now the rub is, whether this extraordinary shortness of cars is the result of increased traffic or of the poor condition of the rolling stock of the railroads."

To comment upon the phenomenal market activity in certain coal railroad stocks that has existed for some days would be superfluous, as you are at the fountain-head of the business.

Six hundred tons of soft coal in 30 cars were burned up at a railroad accident a few miles from Buffalo last week. The wrecked train consisted of 51 cars laden with petroleum oil and coal; cause of accident, a broken wheel. Coal and oil make a good fuel when combined.

The advance in lake freights on coal took place as predicted last week, but at much higher figures than were expected. The advance has been well maintained, there being only one propeller that has made a concession since the dollar rate prevailed. Buffalo's rates have come up to those of other Lake Erie ports, and thereby a considerable amount of tonnage has come here. Shippers claim that "rail rates at $2 to Chicago are better than water rates at half that price, but the uation is such that the coal must largely go by

water, in order to reach the dockyards, some having no rail connection at all." To-day, the freight market was quiet and steady; great difficulty experienced in loading vessels from lack of coal. This trouble has existed for several days.

The Lockport, New York, correspondent of a daily paper publishes the following: "It is stated that two coal dealers who fought the formation of the local combination are doing a third of the total business, if not more. Provided this is true, it is not unreasonable to suppose that their competitors would be only too glad to break up the 'Exchange,' and resume the standard of each on his own hook. But this is a step they can not take now; the companies from whom they purchase were highly gratified at the 'protective measures' they saw fit to adopt, and should they undertake to return to first principles, doubtless they would find their supplies stopped or be subjected to annoyances that would be equivalent to as much."

The coal shipments by lake Westward from September 23d to 29th, both days inclusive, were 53,320 net tons; namely, 10,400 to Chicago, 16,970 to Milwaukee, 11,000 to Duluth, 500 to Detroit, 1860 to Toledo, 600 to Green Bay, 7480 to Superior City, 550 to Windsor, 50 to Port Stanley, 2100 to Menominee, 750 to Saginaw, 620 to Port Arthur, 90 to Kingsville, and 350 to St. Ignace; making a total for the season of 1,109,169 net tons (including vessels cleared from Tonawanda, but destination not stated). The engagements and rates reported were as follows: 80c.@$1 to Chicago and Milwaukee; 95c. to Port Arthur and Fort William; 80c. to St. Ignace; 75c. to Menominee and Green Bay; 60c. to Duluth, Superior City, and Connor's Point; 20c. to Detroit, Windsor, and Toledo; 50c. to Saginaw; and 20c. to Port Stanley.

The coal charters by canal reported during the past week were as follows: 2 loads to Syracuse, 95c. gross ton, free on and off; 1 load to Troy, $1.30 net ton, free on and off; and 2 loads to Lockport, 40c. net ton, free on and off. The nominal rate to New York, $2; and to Albany, $1.45 per net ton, captain to pay loading and unloading.

The receipts of coal by canal for the fourth week in September at this port, 1527 tons; the shipments for the same period, 249 tons.

P.S.—Since the above was written, the Natural Fuel Gas Company has issued another circular, stating that the price will be 50c. instead of 75c., bills to be paid within five days of delivery, or else 10 cents will be added.

Boston. Sept. 29.

[From our Special Correspondent.]

It appears that our retailers were not able to deliver the goods, so to speak. They ordered an advance in retail prices, to take effect last week Monday, but one or two dealers refused to come in. These parties have been labored with, and another advance announcement made this week, which it is hoped will be successful. Despite this drawback, the anthracite jobbers feel more hopeful in this market. They have had rather more trade, and expect a materially increased demand in the immediate future. The compromising of the Reading Railroad troubles encourages the trade to hope for smoother management of anthracite coal affairs in the future and imparts a strength to the situation. It must not be forgotten that prices are now at a point where outsiders can cut them from 5 to 10 cents and still get a good thing. Close buyers will find coal now offered in this way. The company prices are quoted very firmly, however, at $4, f.o.b. at New York, for Stove; $3.70 for Egg; $3.50 for Broken; and $3.55 for Chestnut. This is an advance of one dollar a ton over the lowest prices of the season. But $4 is not high for stove coal. The common talk is of an advance right away. The amount of coal that is sold at more than prices now current will be small in the opinion of good judges in this market. Broken coal is already selling at $1 a ton higher than best bituminous coal.

While bituminous coal has become the steam coal of New England, the demand for it at this closing period of the season is very light. No more business of any amount is expected until the new season opens. It is hoped then that the Philadelphia & Reading settlement will affect trade advantageously. F.o.b. prices continue nominally at $2.10@$2.15.

Minimum rates are still maintained by the Vessel-Owners' Association. Occasionally we hear of outside vessels chartering from New York at 90 to 95 cents flat. Quick dispatch must be guaranteed to get this rate.

We quote rates exclusive of discharging:

New York, 80@90c.; Philadelphia, $1@$1.05; Baltimore, $1.10@$1.15; Newport News and Norfolk, $1.05@$1.10; Richmond, $1.10@$1.15; Cape Breton, $1.85@$2; Bay of Fundy, $1.60.

As noted above, inharmony among the large retail dealers prevents the speedy establishment of an advance. Quotations are nominally as follows, and will be actually so if no new complication arises:

White ash, furnace and egg	$5.00@$5.25
" stove and nut	5.25@ 5.50
Lehigh furnace, egg and stove	5.50@ 5.75
" nut	5.50@ 6.00
Shamokin egg	5.50@ 6.00
" stove	5.75@ 6.00
Lorberry egg and stove	@ 6.50
Franklin egg and stove	@ 7.00

Pittsburg. Sept. 30.

[From our Special Correspondent.]

Repairs to Monongahela locks being completed, coal can pass to lower landing, to be ready for first Ohio rise. There have been mined to this time about seven or eight millions. There is a light rise in both rivers, not sufficient to let out coal, but sufficient to enable boats and their tows that went out in the last rise to reach port with a supply of empties that will give employment to miners for some time to come.

Prices of coal: River, wholesale, f.o.b., 3¾@4¾c.; Railroad, 4¼@4¾c.

Connellsville Coke.—The coke operators at their last meeting decided to draw the ovens five days a week instead of six. There is a constant increase of productive capacity. The price for October has been fixed. It is the same as for September. Blast-Furnace, $1.50, f.o.b. cars at ovens; Foundry, $1.75; Crushed, $2.25.

FINANCIAL.

Mining Stocks.

NEW YORK, Friday Evening, Oct. 1.

Business continues to increase in mining stocks, notwithstanding that there have been a few dull days. Prices are well maintained, and in some cases quite an advance has been made.

Considerable interest has been shown in Caledonia, and the stock has advanced from 75c.@$2.15, reacting to $1.25. The dealings have not been very large, only 1900 shares changing hands. It is said that a syndicate has secured the property, and will develop the mine. Plymouth continues firm, with small dealings. We give an extended report on this property in our Mining News. The Bodie stocks have been strong and in good demand. Bodie sold at from $2.50@$2.70, with dealings of 2525 shares. Bulwer was quite active at steady prices, selling at from $2@$1.75@$1.80. Standard sold at 83c., with a small business. Mono was in fair demand at steady prices, selling from $2.65@$2.50.

The Colorado stocks were moderately dealt in at steady prices. Leadville sold at from 36@38c., with sales of 2800 shares. Little Pittsburg was quiet and steady at 46c. Little Chief records but a small business, and sold at from 23@24c. La Crosse was fairly active at from 8@7c.

Homestake shows an advance in price to $19.50, and was in moderate demand. Deadwood sold to the extent of 1100 shares, at an advance from $2.50@$2.60.

Horn-Silver continues strong, and this week sold at from $2@$2.15, with sales of 2320 shares.

A decline has occurred in North Belle. It sold this week at from $2.65@$2.10, and recorded large transactions. Navajo also declined, selling at from 87@57@62c., with sales of 4000 shares. The Comstocks were faily dealt in, but were on the decline. Consolidated California & Virginia declined from $2.75@$2.40. Hale & Norcross shows but small dealings at from $1.10@$1. Sierra Nevada sold at from 30@27c., under small transactions; and Sutro Tunnel sold at from 7@8c.

Rappahannock was very largely dealt in, and sold at 9c. throughout.

The total transactions were 66,855 shares, showing an increase of 1089 shares, as compared with the preceding week.

Judge Churchill, in the Supreme Court, has rendered a decision against the Commercial Telegraph Company in two actions affecting the relations of that company to the Consolidated Stock and Petroleum Exchange. The case just decided arose from the granting of certain injunctions in February, 1885, restraining the Commercial Company from interfering with stock quotation instruments. Some time ago, a decision was rendered by Judge Cullen adjudging the Commercial Company in contempt for disobeying an injunction by removing some instruments, and compelling it to restore them to their place. The company then applied for an injunction against the Exchange, and asked to have other suits consolidated and the venue changed. The effect of the present decision of Judge Churchill is to deny the requests of the telegraph company, and is a victory for the Consolidated Exchange.

Coal Stocks.

The bull fever has raged this week, although the market has been worked in sections. The coal stocks have been rather quiet, but look as though they were bound to a higher plane all around. The dealings in Lackawanna have aggregated 145,165 shares at $138@$140, closing at $136⅝, ex dividend. Delaware & Hudson, with transactions of 22,013 shares at $105¼@$107½, closed at $106. Reading had dealings of 313,097 shares at $37¾@$35, closing at $35⅝. Jersey Central ranged between $63⅝@$60¾, and closed at $61⅝, with sales of 77,782 shares. The bituminous stocks have had a moderate business at firm prices.

Meetings.

The annual and special meetings of the following companies will be held at the times mentioned:

Eureka Consolidating Mining Company, San Francisco, Cal., October 18th, at half past eleven A.M., for the election of directors.

Huron Mountain Land and Mining Company, Mead's Block, Ontonagon, Mich., October 11th, at eleven o'clock A.M.

Kanawha Land and Mining Company, No. 69 Wall street, Room 56, New York City, October 4th, at two o'clock P.M.

Mount Pleasant Mining Company, No. 18 Wall street, Room 47, New York City, October 6th, at twelve o'clock M.

Ophir Gold Mining Company, No. 30 Cortlandt street, New York City, October 15th, at three o'clock P.M.

Philadelphia & Cherry Run Petroleum Company, office of S. B. Huey, No. 36 South Third street, Philadelphia, Pa., October 7th, at four o'clock P.M., to vote on a proposition to lease the real estate belonging to the company.

Rat Hole Mining Company, No. 140 Nassau street, Room 24, New York City, October 5th, at eleven o'clock A.M.

Dividends.

Plymouth Consolidated Gold Mining Company, of California, has declared dividend No. 40 of twenty-five cents a share, or $25,000, payable October 5th, at No. 23 Nassau street, New York City.

Pipe-Line Certificates.

Messrs. Watson & Gibson, No. 49 Broadway, report as follows for the week:

To chronicle the events of the petroleum market during the past week, in so far as facts and figures go, requires but little in the way of space. Transactions have been exceedingly limited in volume, and the quotations show but slight fluctuations comparatively. The market looks like lower prices; and as we have had occasion to say, the bulls have not even the encouragement of one of Wiggins's prophecies to rely upon at the moment. One of our oil country friends advises us to-day by telegraph that down there the market looks very tired and heavy, and that in his opinion it will not rally much, but that we may look for plenty of news from the oil country between now (Friday) and next Monday. This may be a Wiggins prophecy for the bears, and the Shoustown and Washington fields may have something big in store for our consideration. The policy of the controlling powers seems to be for low ruling prices in crude for a time yet. The oil brokers are making hay just now at the stock end of the Board, and this line is daily improving to the benefit of their customers.

The following table gives the quotations and sales at the Consolidated Stock and Petroleum Exchange:

	Opening.	Highest.	Lowest.	Closing.	Sales.
Sept. 25	61¾c.	64⅞c.	64¼c.	64¾c.	771,000
27	65	65	62⅞	63	2,916,000
28	62⅞	63	62⅛	62⅝	2,703,000
29	62⅛	63⅛	62⅜	62⅜	1,928,000
30	62⅛	62¾	62¼	62⅝	1,373,000
Oct. 1	62⅜	62⅝	62⅜	62½	798,000
Total sales					10,489,000

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par value	Assessments. Total levied to date.	Assessments. Date and amount per share of last.	Dividends. Total paid to date.	Dividends. Date and amount per share of last.
1	Adams, s. L.	Colo.	$1,500,000	150,000	$10	*		$472,500	Sept 1886 15
2	Alice, s. C.	Mont	10,000,000	400,000	25	*		750,000	Sept 1886 .06¾
3	Amie Con., s. L.	Colo.	5,000,000	500,000	10	*		330,000	Oct. 1883 .05
4	Amy & Silversmith, s.	Mon.		341,419				68,284	Aug 1886 .10
5	Atlantic, c.	Mich	1,000,000	40,000	25	$240,000	Apl. 1875 $1.00	320,000	Jan. 1886 $1.00
6	Argents, s	Nev..	10,000,000	100,000	100	295,000	July 1885 .10	40,000	Feb. 1880 .20
7	Barbee & Walker, s.	Utah	1,000,000	100,000	10	*		60,000	Nov 1880 .10
8	Bassick, c. s.	Colo.	10,000,000	100,000	10	*		400,000	Mar. 1884 1.00
9	Belle Isle, s.	Nev..	10,000,000	100,000	100	140,000	May 1886 .10	300,000	Dec. 1879 .25
10	Belcher, c. s.	Nev..	10,400,000	104,000	100	2,217,335	ec. 1885 20	15,397,000	Apl. 1876 1.00
11	Bellevue Idaho, s. L.	Idah.	1,250,000	125,000	10	26,250	Dec. 1883 10	125,000	Aug 1886 .10
12	Big B'nd Hydraulic, c	Dak..	1,000,000	200,000	5	*		192,000	Sept 1886 .03
13	Black Bear, c.	Cal..	3,000,000	30,000	100	22,500	Dec. 1884 .25	895,000	May 1883 .20
14	Bodie Con., c. s.	Cal..	10,000,000	100,000	100	324,990	Jun. 1886 .50	1,602,572	Apl. 1885 .50
15	Bonanza Developm't C & M		3,000,000	300,000	10			135,000	Oct. 1882 .15
16	Bonanza K'g, Cons. s.	Cal..	1,000,000	100,000	10	*		185,000	Feb. 1885 .10
17	Boston & Mont, c.	Mont	2,000,000	200,000	10	*		520,000	Jun 1886 .15
18	Breece, s	Colo.	5,000,000	200,000	25	*		2,000	Feb. 1880 .01
19	Brooklyn Lead, L. s	Utah	500,000	50,000	10			102,000	Sept 1886 .05
20	Bulwer, c.	Cal	1,000,000	100,000	100	40,000	Oct. 1885 20	175,000	Jan. 1884 .10
21	Caledonia, c.	Dak.	10,000,000	100,000	100	505 000	May 1885 .15	40,000	Feb. 1886 .10
22	Calumet & Hecla, c.	Mich	2,500,000	100,000	25	1,200,000	.. ....	27,850,000	Jun. 1886 5.00
23	Carbonate Hill, s. L.	Colo.	4,000,000	200,000	10	*	...	80,000	Apl. 1884 .05
24	Caribou Con., s.	Colo.	1,500,000	150,000	10	*		50,000	Mch 1880 .10
25	Castle Creek, c.	Idah.	1,000,000	100,000	1			51,000	Oct. 1883 .03
26	Catalpa, s. L.	Colo.	3,000,000	300,000	10	*		270,000	May. 1884 .10
27	Central, c.	Mich	500,000	20,000	25	100,000	Sept 1861 .06	1,780,000	Jan. 1886 2.00
28	Christy, s.	Utah	10,000,000	100,000	100			10,000	Jun. 1884 .10
29	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*		1,650,000	Dec. 1884 .25
30	Colorado Central, s. L.	Colo.	2,750,000	275,000	10	*		143,75	Oct. 1886 .05
31	Cons. Cal & Va., c. s.	Nev..	21,600,000	216,000	100	198,000	Jan. 1885 .20	64,800	Fe 1886 .80
32	Con. Gold Mining, c.	Ga...	500,000	100,000	5	*		108,000	Nov. 1883 .02
33	Contention, s.	Ariz.	12,500,000	250,000	50			2,587,000	Dec. 1884 .25
34	Crescent, s. L. c.	Utah	15,000,000	600,000	25	*		210,000	Aug. 1886 .05
35	Crown Point, c. s.	Nev..	10,000,000	100,000	100	2,675,000	Feb. 1882 .25	11,588,000	Jan. 1875 2.00
36	Deadwood-Terra, c.	Dak..	5,000,000	200,000	25	*		900,00	Jan. 1883 .10
37	Derbec B. Grav., c. s.	Cal..	10,000,000	10 ,000	100	90,000	Dec. 1881 .10	140,000	Jun. 1886 .10
38	Dunkin, s. L.	Colo.	5,000,000	200 000	25	*		220,000	Sept 1884 .05
39	Elkhorn, c. s.	Mont	1,000,000	100,000	10	5,000	July 1883 .50	140,000	Sept 1886 .50
40	Eureka Con., c. s. L.	Nev..	5,000,000	50,000	100	50,000	July 1886 1.00	4,817,500	July 1882 .25
41	Evening Star, s. L.	Colo.	3,000,000	30,000	10	*		1,480,000	Nov 1883 .50
42	Excelsior, c.	Cal..	10,000,000	100,000	100	560,000	Sept 1885 1.00	875,000	Oct. 1880 .25
43	Father de Smet, c.	Dak..	10,000,000	100 000	100	200,000	Nov 1878 1.00	1,125,000	Dec. 1885 .20
44	Franklin, c.	Mich	1,000,000	40,000	25	220,000	Jun 1871	52 ,000	Jun. 1886 1.00
45	Freeland, c. s.	Colo.	5,000,000	200, 000	25	*		190,000	July 1886 .10
46	Fresno Enterprise, c.	Cal..	5,000,000	100,000	50		Mch 1883 .10	110,000	July 1882 .10
47	Gould & Curry, c. s.	Nev..	10,800,000	108,000	100	4,055,000	Sept 1886 .50	3,826,000	Oct. 1870 10.00
48	Grand Central, s.	Ariz.	1,000,000	100,000	10			625,000	Dec. 1882 .25
49	Grand Prize, s.	Nev..	10,000,000	100,000	100	570, 0	Apl. 1886 .50	495,000	Mar. 1884 .25
50	Granite, s.	Colo.	125,000	25, 000	1			6,250	May 1883 .01
51	Granite Mountain, s.	Mont	10,000,000	400,000	25			1,400,000	Sep. 1886 .25
52	Green Mountain, c.	Cal..	1,250,000	125, 000	10	*		212,000	Nov. 1881 .07½
53	Hale & Norcross, c. s.	Nev..	11,200,000	112,000	100	4,930,000	July 1886 .50	1,598,000	Apl 1871 5.00
54	Hall-Anderson, c.	N. S..	150,000	150,000	1			7,000	Jan. 1882 .05
55	Hecla Con., s. G. L. C.	Mont	1,500,000	30,000	50	*		1,032,000	July 1886 .50
56	Hel'a Mg & Red, c. s. L.	Mont	3,315,000	663,000	5	*		197,97	July 1886 .06
57	Holmes, s	Nev..	10,000,000	100,000	100	300,000	Sept 1885 10	75,000	Apl. 1886 .25
58	Holyoke, c.	Idah.	200,000	200,000	1			27,000	Feb. 1883 .10
59	Homestake, c.	Dak.	12,500,000	125,000	100	200,000	July 1879 1.00	3,568,750	Sept 1886 .40
60	Honorine, s. L.	Utah	5 0,000	250,000	2	25,000	Jun. 1883	75,000	Sept 1886 .05
61	Hope, s.	Mont	400,000	8,000	50	*		158,252	Oct. 1884 1.50
62	Horn-Silver, s. L.	Utah	10,000,000	400,000	25	*		4,000,000	Nov. 1884 .50
63	Idaho, c.	Cal..	310,000	3,100	100			3,750,000	Jun. 1886 7.50
64	Ideal, s. L.	Colo.	1,500,000	150,000	10			7,500	July 1886 .05
65	Independence, s.	Nev..	1 ,000, 000	100,000	100	320,000	Aug. 1885 .20	225,000	Sept 1879 .25
66	Indian Queen, s.	Nev..	250,000	125,000	2			368,750	July 1883 .03
67	Inyo, c.	Cal..	500,000	100,000	5	*		45,000	Apl. 1882 .05
68	Iron Hill, s.	Dak.	2,500,000	250, 000	50	82,500	Oct. 1885	100,000	Sept 1886 .05
69	Iron-Silver, s. L.	Colo.	10,000,000	500,000	50	*		1,700,000	July 1886 20
70	Jackson, c. s.	Nev.	5,000, 000	50,000	100	10,000	Nov. 1880 .20	40,000	Jun. 1886 .10
71	Jocuistita, s.	Mex.	2,500,000	250,000	10			1,200,000	Feb. 1885 .50
72	Kentuck	Nev..	3,000, 00	30,000	100	342,000	Nov 1881 .30	1,350,000	July 1884 .10
73	La Plata, s. L.	Colo.	2,000,000	200,000	10	*		610,000	Sept 1882 .30
74	Leadville Cons., s. L.	Colo	4,000,000	400,000	10	*		390,000	May. 1886 .05
75	Lexington, c. s.	Mont	4,000,000	40,000	100	*		585,000	Jan. 1885 2.00
76	Little Chief, s. L.	Colo	10,000,00	2 0,000	50	*		780,000	Mch 1885 .10
77	Little Pittsburg, s. L.	Colo.	20, 000,000	200,000	100	*		1,050, 00	Mch. 1880 .50
78	Manhattan, s.	Nev..	5,000,000	50,000	100	150,000	July 1879 1.00	437,500	Feb 1886 .25
79	Marguerite, c.	Cal..	500, 00	25,000	20			18,750	Oct. 1882 .25
80	Marion Bullion, c.	N.C	500,000					15,000	Jan. 1886
81	Martin White, s.	Nev.	10,000,000	100,000	100	1,15 ,000	Mar. 1886 25	90,000	July 1879 .30
82	Minnesota, c.	Mich	1,000,000	40,000	25	420,000	Apl. 1888 1 00	1,820,000	Mar. 1876
83	Mono, c.	Colo.	5,000,000	5,000	100	56 ,00	Jun. 1885 .50	12,50	Mar. 1886 .25
84	Montana, Lt., c. s.	Mont	3,300,000	330,000	10	*		630,300	July 1886 .62
85	Morning Star, s. L.	Colo.	1,000,000	100,000	10			625,000	Sept 1886 .25
86	Moulton, s. c.	Mont	2,000,000	100,000	5	*		200,000	Aug 1886 .07½
87	Mount Pleasant, c.	Cal.	150,000	150,000	1	*		105.000	Mar. 1884 .10
88	Mt. Diablo, s.	Nev	5,000,000	50,000	100	137,500	Jun. 1880 2.00	80,000	July 1885 .20
89	Napa, c.	Cal..	700,000	100,000	7			200,000	Jan. 1883 .10
90	Navajo, c. s.	Nev..	10,000,000	100,000	100	395,000	Mar. 1886 25	325,000	Feb. 1885 .25
91	N. Hoover Hill, c. s.	N. C.	300,000	120,000	2½	*		30,000	Dec. 1885 .06¾
92	New York Hill, c.	Cal..	5,000,000	50,000	100	62,500	Oct 1885 .15	215,000	Aug. 1882 .10
93	Northern Belle, s.	Nev..	5,0 0,000	50,000	100	425,00	Jan. 1884 8.00	2,400,000	Apl. 1883 .50
94	North Belle Isle, s.	Nev..	10,000,000	100,000	100	150,000	Mar 1886 .20	3 ,000	Aug. 1881 .15
95	Ontario, s. L.	Utah	15,000,000	150,000	100			7,700,000	Sept 1886 .50
96	Ophir, c. s.	Nev..	10,000,000	100,000	100	3,957,80	Jun. 1886 .25	1,595,000	July 1882 1.00
97	Original, s. C.	Mont	1,5 0,000	60,000	25	*		114.000	Oct 1884 .05
98	Osceola, c.	Mich	1,250,000	50,000	25	480,000	Apl. 1876 1.60	972,500	Sept 1884 25
99	Oxford, c.	N. S.	125,000	125,000	1	*		34,500	Oct. 1885 .02
100	Paradise Valley, c. s.	Nev.	10, 00,000	100,000	100	47,000	Mar. 1882 .15	110,000	Aug. 1886 .25
101	Pleasant Valley, c. s.	Cal..	10, 00,000	100,000	100	40,000	Mar. 1884 .10	30,000	Dec. 1882 .05
102	Plutus, c. s. c. L.	Colo.	2,000,000	200,000	10	*		20,0 0	Feb. 1886 .10
103	Plymouth Con., c.	Cal..	5, 00,000	100, 00	50			1,775,000	Oct. 1883 .25
104	Prussian, s. L.	Colo	1,500,000	150,000	10			132,000	Jan 1883 .10
105	Quick-Silver, pref., Q	Cal..	4,3 0,000	43,000	100			785,150	Aug. 1886 1.25
106	" com., Q	Cal .	5,700,000	57,000	100			151,000	July 1882 .40
107	Quincy, c.	Mich	1,000,000	40,000	25	200,000	Dec. 1862	4,410,000	July 1883 2.00
108	Richmond, s. L.	Nev..	1,350,000	54,000	25	*		4,177,587	May 1886 1. 25
109	Ridge, c.	Mich.	5 0,000	20,000	25	220,000	Mar 1885 .50	10 ,000	Feb. 1880 .50
110	Rising Sun, s.	Dak..	750,000	150,000	5	*		32,000	May 1881 .07½
111	Robinson Con., s. L.	Colo.	10, 00,000	200,000	50	*		585,000	Mar. 1886 .05
112	Robert E. Lee, s. L.	Colo.	10,000,000	500,000	20			100,000	Dec. 1882 .10
113	Sooks, c.	Vt..	500,000	50,000	10			61,000	Apr 1885 .30
114	San Francisco, c.	Cal..	5, 0,000	50,000	100	45,000	Sept 1880 .50	20,000	Feb. 1881 .05
115	Savage, s.	Nev..	1,2 0,000	112,000	100	6,156,000	Jun. 1886 .50	4,460,000	July 1880 3.00
116	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*		50,000	July 1884
117	Shoshone, c.	Idah.	15 ,000	150,000	1			7,500	Apl. 1883 .01
118	Sierra Buttes, c.	Cal.	225,000	22,500	10			1,430,639	Apl. 1886 .25
119	Sierra Grande, s.	N. M.	2,5 0,000	500,000	5			860,000	Sept 1884 .25
120	Sierra Nevada, c. s.	Nev..	10, 00,000	100,000	100	5,972,898	Sept 1886 .25	102,000	Jan. 1871 1.00
121	Silver Cord, c. s. L.	Colo.	5,000,000	500,000	10			225,000	Nov. 1883 .25
122	Silver King, s.	Ariz.	10,000, 0	100,000	100			1,750,000	Aug. 1886 .25
123	Silverton, c. s. L.	Colo.	2, 00,000	200,000	10	*		64,000	Aug 1886 .02
124	Small Hopes Cons., s.	Colo.	5,000,000	250,000	20	*		2,325,000	Sept 1886 .20
125	Smuggler, s. L.	Colo.	600,000	6 ,000	10			66,700	Aug. 1883 .25
126	Socorro, c.	N. M.	250,000	2 ,000	10			4,000	Mch 1882 .00¾
127	South Yuba, c.	Cal..	2,000,000	1 ,000	50	*		150,000	Oct. 1881 .75
128	Spring Valley, c.	Cal..	2 0,000	2 0,000	1	*		50,000	Jan. 1881 .25
129	Standard, c. s.	Cal..	10 00,0	1 0,0 0	100	25,0 0	Oct. 1884 .25	4,425,000	Mar. 1884 .25
130	Stormont, s.	Utah	5 0,0 0	500, 00	1	*		155,000	Nov. 1881 .05
131	St. Joseph, L.	Mo..	1,1 0,00	110,000	10	*		562,000	July 1886 .60
132	Syndicate, c.	Cal..	10,000,000	100, 00	100	33,729	July 1882 .15	48,308	Sept 1885 .10
133	Tip Top, s.	Ariz	10,000,000	100, 0 0	100	250,000	Sept 1883 .25	100,000	Nov. 1881 .20
134	Tombstone, c. s. L.	Ariz	12,5 0,000	50 ,000	25	*		1,250,000	Apl. 1882 .10
135	True Fissure, c. s. L.	Utah	1,500,000	150,000	10	*		75,000	Jun. 1883 .15
136	United Verde, c.	Ariz.	3,000,000	300,000	10	*		97,500	Feb. 1884 .20
137	Valencia, M.	N. M.	150,000	1,500	100	*		41,25	Apl 1886 2.50
138	Vizina, s.	Ariz.	5,000,000	200,000	25	*		140,000	Apl. 1882 .10
139	Yankee Girl	Colo.	2,500,000	250,000	10	*		1,012,500	Aug. 1886 .10
140	Yellow Jacket, c. s.	Nev..	12,000,00	12,000	100	5,44 ,00	Dec. 1863 .75	2,184,000	Aug. 1871 1 50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last.
1	Agassiz Cons., s. L.	Colo.	$2,500,000	50,000	$50	*	
2	Albion, s. L.	Nev..	15,000,000	150,000	100	$577,000	July 1883 .50
3	Allouez, c.	Mich	2,000,000	80,000	25	240,000	Feb. 1884 .50
4	Alpha Con., c. s.	Nev..	3,000,000	30,000	100	430,000	Mar 1886 .50
5	Alta, s.	Nev..	10,080,000	100,800	100	1,951,400	Feb. 1886 .25
6	American Flag, s.	Colo.	1,250,000	125,000	10	300,000	Jun. 1877 .25
7	Angio-Montana, Lt.	Mon.	600,000	120,000	5		
8	Appalachian, Lt., c.	N. C.	1,500,000	300,000	5		
9	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10		
10	Barcelona, c.	Nev..	5,000,000	200,000	25	*	
11	Battle Creek, c.	Dak..	5,000,000	2 0,000	25		
12	Bear Creek.	Cal..	300,000	300,000	1		
13	Bechtel Con., c.	Cal..	10,000,000	100,000	100	173,500	n. 1883 .10
14	Belvidere.	Cal..		60,000		92,000	b. 1882 .15
15	Belmont, s.	Nev..	5,000,000	50,000	100	735,000	Apl. 1886 .10
16	Best & Belcher, c. s.	Nev.	10,080,000	100,800	100	1,748,590	Sept 1886 .50
17	Big Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*	
18	Black Jack, c.	Cal..	250,000	100,000	2½		
19	Bonanza Chief	Mon	1,000,000	1,000,000	1	*	
20	Bondholder.	Colo	500,000	200,000	2½		
21	Boston Con., c.	Cal..	10,000,000	100,000	100	170,000	Nov 1883 .25
22	Bradshaw, s.	Ariz.	2,250,000	225,000	10		
23	Buckeye Common.	Colo.	2,000,000	400,000	5	*	
24	Bull Domingo, s. L.	Colo.	10,000,000	200,000	50	*	
25	Bullion, c. s.	Nev.	10,000,000	100,000	100	4,600,000	Aug. 1885 .30
26	Bve and Bye	Ariz.	1,000,000	100,000	10	*	
27	Calaveras, c.	Cal..	500,000	500,000	1	*	
28	Catskill, s.	Nev..	1,500,000	30 ,000	5		
29	Central Arizona, s.	Ariz.	10,000,000	100,000	100		
30	Cen Contin'l, c. s. L.	C & A	2,000,000	200,000	10	*	
31	Charles Dickens.	Idah	1,250,000	250,000	5		
32	Cherokee, c.	Cal..	1,500,000	150,000	10		
33	Chollar, s.	Nev..	11,20 ,0 0	112,000	100	1,040,000	Aug. 1886 .50
34	Cinnamon Mt., c. s.	Colo.	750,000	150,000	5		
35	Climax, s. L.	Colo.	2,000,000	200,000	10	*	
36	Colorado No. 2, s. L.	Colo.	100,000	10,000	10		
37	Con. Imperial, c. s.	Nev..	50,000,000	500,000	100	1,100,000	Aug. 1886 .10
38	Con. Pacific, c.	Cal..	6,000 000	60,000	100	174,000	Feb. 1886 .15
39	Cons Silver, s.	Mo..	2,500,000	250,000	10		
40	**Cop. Queen Cons., c.	Ariz	1,400 00	140,000	10		
41	Courtlandt.	Colo	500,000	50,000	10		
42	Crescent, s. L.	Colo.	3,000,000	300,000	10	*	
43	Crocker, s.	Ariz.	10,000,000	100,000	100	65,000	May 1886 .20
44	Crowell, c.	N. C	500,000	500,000	1		
45	Dahlonega, c.	Ga...	250,0 0	250,000	1	*	
46	Dandy, s.	Colo.	5,000,000	500,000	10		
47	Dardanelles, c.	Cal..	1,000,000	100,000	10		
48	Decatur, s.	Colo.	1,500,000	300,000	5	*	
49	Denver City, s. L.	Colo.	5,000,0 0	500,000	10	*	
50	Denver Gold.	Colo.	300,000	60,000	5		
51	Deseret, c. s.	Utah	500,000	50,000	10	*	
52	Dunderberg, s.	Colo	1,500,000	150,000	10	*	
53	Durango, c.	Colo	500,000	500,000	1	*	
54	Durango T.	Mex	120,000	1,200	100		
55	Eastern Dev. Co., Lt	N. S.	1,500,000	150,000	10	990,000	Mar. 1886 1.60
56	Elko Con., s.	Nev..					Mar 1884 .15
57	Empire Lt., c.	Mon.	5 0,000	130,000	5		
58	Empire, s.	Utah	10,000,000	100,000	100	*	
59	Enterprise., s. L.	Colo.	800,000	80,000	10	*	
60	Eureka Tunnel, s. L.	Nev..	10,000,000	100,000	100	*	
61	Exchequer.	Nev.	10,000,000	100,000	100	840,000	Aug 1885 .20
62	Garfield, Lt., c. s.	Nev.	500,000	100,000	5		
63	Gold Placer, c.	Colo.	5,000,000	200,000	25	*	
64	Goodshaw, c.	Cal..	10,000,000	100,000	100	229,314	Dec. 1885 .25
65	Grand Belt, c.	Tex.	12,000,000	120,000	100	*	
66	Grand Duke.	Colo.	800,000	80,000	10		
67	Gregory-Bobtail, c.	Colo.	550,000	550,000	1		
68	Gregory Con., c.	Mon.	3,000,000	300,000	10	*	
69	Hariem M. & M. Co., c.	Cal..	1,000,000	200,000	5		
70	Head Cent. & Tr. s. c.	Ariz.	10,000,000	100,000	100		
71	Hidalgo, s.	Mex.	200,000	20,000	10		
72	Highland, c.	Mich	500,000	25,000	25		
73	Hortense, s.	Colo.	2,000,00	20 ,000	10		
74	Iroquois, c.	Mich	1,250,000	50, 00	25		
75	J. D. Reymert.	Ariz	10,000,000	10,000	100	*	
76	Julia Cons., c. s.	Nev..	11,000,00	110,000	100	1,438,000	Nov 1885 .10
77	Kearsarge, c.	Mich	1,250,000	50,000	25	100,000	Apl. 1886 5.00
78	Lacrosse, c.	Colo.	1 00,00	100,000	10	*	Sept 1882 .25
79	Lee Basin, s. L.	Colo.	5,000,000	500,000	10		
80	Leviathan, s.	Nev..	10,000,000	100,000	100	380,000	Jan. 1885 .10
81	Lucerne, s.	Colo.	5,000,000	500,000	10	*	Dec. 1881
82	Mammoth Bar, c.	Cal..	10,000,000	100,000	100	50,000	Dec. 1881
83	Mariposa pref., c.	Cal..	5,000,000	50,000	100	1,687,500	Feb. 1883 .25
84	" common, c.	Cal..	10,000,000	100,000	100	1,975,000	Dec. 1881 .20
85	May Belle, c.	Cal..	10,000,000	100,000	100	84,000	Mar 1884 .15
86	Mayflower Gravel...	Cal..	1,0 0,000	100,000	100	85,000	Sept 1886 .25
87	Mexican, c. s.	Nev.	10,000,000	100,000	100	2,565,700	Jun. 1886 .25
88	Mike & Starr, s. L.	Colo	1,000,000	200,000	5	*	
89	Miner Boy, c. s. L.	Colo	5,000,000	500,000	10	*	
90	Miller.	Nev	5,000,000	200,000	25	*	
91	Moose Silver, s.	Colo.	3,000,000	300,000	10	*	
92	Nachoochee, Lt., c.	Ga..	1,000,000	200,000	5		
93	New Pittsburg, s. L.	Colo	2,000,000	200,000	10	*	
94	North Standard, c.	Cal..	10,000,000	100,000	100	20,000	Nov
95	Noonday.	Cal..	600,000	60,000	10	208,000	Dec. 1881 .10
96	Old Dominion, c.	Ariz.	3,000,000	300,000	10		
97	Oriental.	Nev..	2,000,000	200,000	10		
98	Oriental & Miller, s.	Nev..	10,000,000	400,000	25		
99	Overman, c. s.	Nev..	11,520,000	115,200	100	3,702,320	July 1886 .15
100	Parrott, c.	Mon.	1,800,000	180,000	10		
101	Park, s.	Utan	2,000,000	200,000	10		
102	Peer, s.	Ariz.	10,0 0,000	100,000	100	125,000	Apl. 1886 .10
103	Peerless, s.	Ariz.	10,000,000	100,000	100	275,000	May 1886 .50
104	Potosi.	Nev..	10,200,0 0	112,000	100	1,078,400	Aug 1886 .30
105	Quin y	Colo.	3,000,000	300,000	10		
106	Rappahannock, c. s.	Va..	250,000	250,000	1	*	
107	Red Elephant, s.	Colo	500,000	500,000	1		
108	Rollins, c. s.	Colo.	4,000,000	200,000	25		
109	Ropes, c. s.	Mich	2,000,000	80,000	25	63,200	Mar 1886 .10
110	S. P. & Canon del A. c.	N. M.	10,000,000	400,000	25	*	
111	Sheridan.	N. M.	2,000,000	200,000	10		
112	Silver Cliff, s.	Colo.	5,000,000	400,000	12½		
113	Sonora Con.	Mex.	5,000,000	200,000	25	*	
114	South Bulwer, c.	Cal..	10,0 0,000	100,000	100	100,000	May 1881 .25
115	South Hite.	Cal..	10,000,000	100,000	100	195,000	Jan. 1883 .05
116	South Pacific.	Cal..	500,000	100,000	5		
117	State Line, s.	Nev.	25 ,000	250,000	1		
118	St. Louis & Mex., s.	Mex.	5,000,000	500,000	10	*	
119	St. Louis & St Elmo	Colo.	2,000,000	200,000	10		
120	St. L. & St. Felipe, c. s.	Mex.	1,500,000	150,000	10		
121	St L. & Sonora, c. s.	Mex.	1,500,000	150,000	10		
122	St. Louis & Yavapai.	Ariz.	3,000,000	300,000	10		
123	Sunday Lake, c.	Mich	1,250,000	50,000	25		
124	Sullivan, c. s. L.	Me...	500,000	100,000	5	125,000	Dec. 1882 .25
125	Sutro Tunnel.	Nev..	20,000,000	2,000,000	10	*	
126	Tamarack, c.	Mich.	1,000,000	40,000	25	520,000	Apl. 1885 3.00
127	Taylor-Plumas, c.	Cal..	1,000,000	200,000	5	*	
128	Tioga Cons., c.	Cal..	10,000,000	100,000	10		
129	Todos Santos, s.	Mex.	1,000,000	100,000	100	325,000	Oct. 1882 .10
130	Tuscarora, s.	Nev.	10,000,000	100,000	100	110,000	Oct. 1881 .15
131	Unadilla, s.	Colo.	50,000,000	500,000	100	*	
132	Union Con., c. s.	Nev..	10,000,000	100,000	100	2,085,000	Apl. 1886 .25
133	United M. Lundy, c.	Cal..	1,000,000	200,000	5		
134	Utah, s.	Nev..	2,000,000	20,000	100	1,820,000	Aug. 1886 .50
135	Vandewater	Nev..	20,000,000	200,000	100	*	
136	Washington	Ariz.	2,000,000	200,000	10		
137	Wellington, s.	Nev..	100,000	50,000	2	*	
138	West Granite Mt., s.	Mon	5,000,000	500,000	10	*	
139	Whalen Copper.	Nev..	2,5 0,000	100,000	25		
140	Whittier Dr'e Bull'n	Nev..	1,000,000	100,000	10		

G. Gold. S. Silver. L. Lead C.

NEW YORK MINING STOCKS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Sept. 25. H.	Sept. 25. L.	Sept. 27. H.	Sept. 27. L.	Sept. 28. H.	Sept. 28. L.	Sept. 29. H.	Sept. 29. L.	Sept. 30. H.	Sept. 30. L.	Oct. 1. H.	Oct. 1. L.	SALES.
Alice, Mon													
Anne Con., Co													
Argenta													
Bassick, Co													
Belle Isle, Ne	50						34		28		.32		3,300
Bodie Cons., Ca	2 60		2.70	2.60			2.55	2.50	2.55		2.70		2,525
Breece													
Bulwer, Ca	1.75		2.00	1.75	1.90						1.80		5,200
Caledonia					.75				2.15	1.50	1.25	1.10	1,900
Carbonate Hill													
Chrysolite, Co	.52										.55	.53	900
Colorado Central	2.35						1.05	.80					300
Cons. Cal. & Va., Ne	2.75	2.70	2.70		2.70		2.70				2.45	2.40	5,800
Crown Point													
Deadwood							2.50		2.50	2.50			1,100
Eureka Cons., Ne													
Father de Smet, Dk			1.00										200
Freeland													
Gold Stripe, Ca													
Gould & Curry, Ne													
Grand Prize, Ne													
Green Mountain, Ca													
Hale & Norcross, Ne					1.10		1.05		1.00				400
Helena	1.70												100
Homestake, Dk					18.00		19 25		19.00		19.50	19.00	345
Horn-Silver, Ut	2 15	2.10	2.15	2.10			2.05	2.00			2.15		2,320
Iron Hill					1.70								100
Iron Silver, Co			1.70								2.10		200
Leadville C., Co	.36		.38	.37	.38		.38		.38	.37	.38	.37	2,800
Little Chief, Co			.24						.24	.23			1,100
Little Pittsburg, Co			.46										200
Martin White, Ne													
Moulton													
Navajo, Ne	.87		.73				.57		.67		.62		4,000
North Belle Isle, Ne	2.40		2.65				2.25		2.20		2.15	2.10	1,600
Ontario, Ut							26.25						45
Ophir									.90				300
Osceola													
Plymouth	16.25				16.25		16.13	16.00	16.25		16.13		380
Quicksilver Pref., Ca	26.00	25 50			25.50						25.00		500
" Com., Ca					6 75								100
Quincy													
Robinson Cons., Co			.44	.40	.44								500
Savage, Ne													
Sierra Nevada, Ne							.30				.30	.27	1,065
Silver King, Ar	4.00						4.25						600
Spring Valley, Ca													
Standard, Ca							.88						300
Stormont, Ut					.12								1,000
Tip Top, Ar													
Yellow Jacket													

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Sept. 25. H.	Sept. 25. L.	Sept. 27. H.	Sept. 27. L.	Sept. 28. H.	Sept. 28. L.	Sept. 29. H.	Sept. 29. L.	Sept. 30. H.	Sept. 30. L.	Oct. 1. H.	Oct. 1. L.	SALES.
Albion													
Alta													
American Flag													
Barcelona, G												.07	2,000
Bechtel Con., G													
Belvidere													
Belcher													
Best & B'cher, G. S											.70		500
Big Pittsburg, S. L													
Bowman Silver													
Bull Domingo, S.L													
Castle Creek												.04	500
Central Ariz'na, S													
Cons. Imperial													
Con. Pacific													
Cusi													
Decatur													
Durango, G													
Eastern Oregon													
Goodshaw, G													
Harlem M. & M. Co													
Harshaw													
Kossuth													
Lacrosse, G	.08				.08		.08	.07	.07				7,400
Mariposa Pref., G													
" Com., G													
Mexican, G. S												.33	125
Mono	2.60	2.50	2.65	2.50			2.50						1,600
New Pittsburg													
North Standard, G													
N. Horn-Silv'r, S L													
Ori'n'l & Miller, S													
Plutus													
Potosi													
Rappahannock, G	.09		.09		.09		.09		.09		.09		10,300
Red Elephant, S													45
Ridge													
Silver Cliff, S	.05												300
Sonora Con													
South Bodie, G													
South Bulwer, G													
South Hite													
South Pacific													
State Line, 1 & 4, S													
" Nos. 2 & 3, S													
Sutro Tunnel							.07					.08	4,000
Taylor Plumas													
Tioga													
Unadilla, S													
Union Cons., G. S									.30		.30	.30	.27	950
Utah													

Dividend shares sold, 39,180. Non-dividend shares sold, 27,675.

San Francisco Mining Stock Quotations.

Daily Range of Prices for the Week.

NAME OF COMPANY.	CLOSING QUOTATIONS. Sept. 24.	Sept. 25.	Sept. 27.	Sept. 28.	Sept. 29.	Sept. 30.
Albion						
Alpha						
Alta	1.50	1.62½	1.50	1.25	.75	.85
Argenta						
Bechtel						
Belcher	1.25	1.25				
Belle Isle						
Best & Belcher	.95	.95	.90	.90	.80	.70
Bodie					2.50	2.62½ 2.62½
Bullion						
Bulwer	1.75	1.75	2.00	2.00	1.87½	1 87½
Challar	.95	.90	.90	.90	.85	.90
Con. Pacific						
Con. Cal. & Va	2.75	2.75	2.75	2.75	2.62½	2.50
Crown Point		1.12½				.95
Day						
Elko Cons						
Eureka Cons		3.75			4.00	
Exchequer						
Gould & Curry	.65	.65	.60	.65	.50	.50
Grand Prize						
Hale & Norcross	1.00	1.00	1.00	1.00	.95	.90
Independence						
Martin White						
Mexican	.50	.50	.45	.40	.35	.35
Mono				2.50		2 62½
Mount Diablo				2.50		2.50
Navajo	.80	.70	.70	.75	.75	.65
Northern Belle						
North Belle Isle						
Ophir	1.25	1.25	1.00	1.00	.90	.85
Overman						
Potosi	.30	.25	.25	.25	.20	.15
Savage	1 75	1.75	1.75	1 87½	1 87½	2.00
Scorpion						
Sierra Nevada	.35	.35	.35	.35	.35	.30
Silver King						
Tip-Top						
Union Cons	.35		.35	.35	.35	.30
Utah	.95	.90	.85	.80	.75	.70
Wales Cons						
Yellow Jacket	.95		1.00	.90	.85	.90

St. Louis Mining Stocks. Sept. 29.

The market since our last weekly report has had quite a change for the better. The assurance of the regular monthly dividend in Granite Mountain, the payment of which this month some had doubted, together with very encouraging news from some of the most prominent properties dealt in in this market, created a demand for the several stocks that could only be supplied at considerably advanced figures. Granite, which had been offered last week at $34.50 without takers, is to-day $37, freely bid, with none offered below $38.50. Yavapai, which last week was $1.12½, is selling at $1.40, with heavy transactions. Adams, Small Hopes, Sheridan all record advances. The demand for favorite mining stocks the last few days has considerably exceeded the supply, the largest transactions having been in Yavapai, of which some 10 00 shares changed hands this week. The reports from this property continue of the most favorable character, the last advices being that the mill and concentrators are doing their work to perfection, and the ore on the dumps is realizing considerably more bullion than was anticipated. The news from Granite has been so uniformly good that stockholders take it as

BOSTON MINING STOCK QUOTATIONS.

	Sept. 24. H.	Sept. 24. L.	Sept. 25. H.	Sept. 25. L.	Sept 27. H.	Sept 27. L.	Sept. 28. H.	Sept. 28. L.	Sept. 29. H.	Sept. 29. L.	Sept. 30. H.	Sept. 30. L.	SALES.
Amie													
Allouez	3.		2.87½		3.		2.75		2.50	2.37½			1,300
Atlantic													
Arnold	.50	.47½	.47½		.45		.47½		.45				850
Aztec													
Belle Isle													
Blue Ridge													
Bodie													
Bonanza D	1.		1.		1.		1.		1.				1,000
Boston & Montana					4.50								100
Bowman Silver	.09						.08						1 000
Bijou Cons													
Breece	.26				.25		.25		.25				1,300
Bulwer													
Calumet & Hecla	225.		226.	225.	225.						225		138
Catalpa	.27½	.25					.28						950
Cedar Spring													
Central							.15						100
Con. Pacific													
Con. Virginia													
Copper Falls													
Crescent			.10						.10				600
"Cusi"			.40										100
Dunkin			.29		.29				.29				500
Empire					.05								500
Eureka													
Franklin	13⅞	13.75	14.		13⅞	13⅜	13.75	13.50	13⅞	13⅜			1,115
Freeland													
Grand Prize													
Hanover													
Humboldt	.15		.15		.15		.15		.15				700
Huron	2 87½	2.75	2 37½						2.37½				260
Mascot													
Mesnard													
Napa			1.	.95									200
Ontario													
Osceola					16.50		16 75						64
Pewabic									1.75				50
Quincy			56.						55.75				102
Ridge													
Robinson													
Security													
South Side	32½												500
Standard													
Star	.20		.20		.15								500
Sutro Tunnel													
Stormont							.11						200
Tamarack													
Winthrop					.10								100

COAL STOCKS.

Name of Company.	Par value of shares.	Quotations of New York stocks are based on the equivalent of $100. Philadelphia prices are quoted so much per share. Sept. 25. H.	Sept. 25. L.	Sept. 27. H.	Sept. 27. L.	Sept. 28. H.	Sept. 28. L.	Sept. 29. H.	Sept. 29. L.	Sept. 30. H.	Sept. 30. L.	Oct. 1. H.	Oct. 1. L.	Sales.
Barclay Coal														
Cameron Coal	50	19	18	18⅝	18	19¼	18¼	19¼	19⅛	19	18⅞	18¾		6,119
Col., C. & I	10	29¼	29			29¼	29⅛	28⅞	28½	28⅞	28¼	28⅛		2,100
Ches. & O. RR	100	11⅝	11⅛	11¾	11⅛	11		11	10¾			9½		2,932
Consol. Coal	100													
Cumb. C. & I	100													
Del. & H. C	100	107⅛	106½	106⅞	106	106¾	105⅝	107⅛	106⅝	106⅞	106	106⅜	105¼	22,013
D., L. & W. RR	50	139¾	138¾	139½	138	139½	138	140	139⅛	140	137¾	137½	136⅜	145,165
Elk Lick Coal Co														
Lehigh C. & N.†	50			52⅛	52¼	52⅛	52¼							1,186
Lehigh Valley RR.†	50			57½		57½	57¼							437
L. & W. C. & I. Co														
Maryland Coal	100	14		13½		14								310
Montauk Coal	100													
Morris & Essex	50					142								40
New Central Coal	100	13½		13⅛		13		13⅝		14		14		1,350
N. J. C. RR.	100	63⅝	62¾	63½	61¼	63	61⅜	63⅜	62½	62¾	61½	62⅛	60¾	77,782
N. Y. & S. Coal	50													
Penn. Coal	50													
Penn. RR.†	50			59⅛	59⅛	60	59⅛							10,152
Ph. & R. RR.*	50	37¾	36⅛	37½	36¼	37¼	35¾	37⅜	36	37	36	36⅛	35	327,950
Spring Mountain	50													
Westmoreland Coal†	50													

* Of the sales of this stock, 14,853 were in Philadelphia, and 313,097 in New York.
† The quotations for these stocks are not percentage, but actual price. Total sales, 597,536.

self-understood, and are not in the least surprised at any new rich development or "strikes." The striking of second contact in the Brookland shaft of the "Adams" mine has caused its shareholders to rejoice, and created quite an active demand for the stock. Sheridan and Peacock also report rich development, and promise early bullion shipments. Altogether, the last week has shown a better tendency in and a more active demand for mining shares than we have been able to record for the last three months.

Name of Company.	Location.	Bid.	Asked.
Adams, s. L	Colo	$5.00	$5.50
Cen. Continental, G. s.	Ark		1.00
Consolidated Silver, s.	Mo		1.00
Courtland	Colo		.65
Dandy, s	Colo		1.00
Granite Mountain, s.	Mont	37.00	38.50
Hope, s	Mont	40.00	45.00
Ideal, s. L	Colo		1.00
Laclede			1.10
Peacock	N. M	3.50	4.00
Puritan			1.00
Quincy	Colo	.15	.25
Sheridan	N. M	4.00	4.15
Small Hopes Cons., s. L.	Colo	7.50	8.00
St. Louis & Mexico	Mex		
St. Louis & Sonora, G. s.	Mex		.27½
St. Louis & St. Elmo	Colo		1.00
St. Louis & Yavapai	Ariz	1.35	1.40

Boston Copper and Silver Stocks.

[From our Special Correspondent.]

Boston, Sept. 30.

There has been a large falling off in the volume of business in mining stocks the past week, owing to the greater activity in the general market, and in consequence prices have declined somewhat, although there is no pressure to sell, holders being content to bide their time rather than submit to lower prices. Ingot copper is strong, and it is generally conceded that higher prices will prevail during the coming winter, and the good dividend-paying copper stocks will sell much above present quotations, and those who buy them now will realize a good profit before next spring. The dullness in the market has checked the demand for the speculative list, although there is only a limited amount of stocks of this class offered in the market. Calumet & Hecla has been firm at $225@$226, although only about 50 shares have been marketed, and more is wanted at $225, and there is none offered. Quincy has ruled steady at $56@$55¾, with few sales, closing at to-day's Board at $55 bid. Franklin has been the most active stock on the list. Some realizing of profits by those who got in at the low prices early caused a slight decline to $13⅝, but the stock was all taken at $13¾@$13⅞, and there was none offered to-day under $14. Osceola declined to $16½ on sale of 50 shares only. Central sold same as last week, at $15, 100 shares. Allouez declined to $2⅝@$2½, with sales of 500 shares. Pewabic sold at $1¾.

Silver stocks have been almost entirely neglected. We note sale of 100 shares Boston & Montana at $4½, a decline of $½. Catalpa sold at 27½c., and Napa at 95c. At the Mining Exchange, business has ruled dull, without much change in prices. Bowman Silver declined to 8c., assessment paid. Dunkin sold at 29c., and is offered at that. "Cusi," offered at 40c. In the low-priced coppers, we note sales of Arnold at 47½c. Aztec, 15@20c. Humboldt, at 15c. Although others are bid for, there are very few stocks offered.

FREIGHTS.

The latest actual charters to October 1st, per ton of 2240 pounds:

To	From Philadelphia	From Baltimore.	From New York shipping ports.
Alexandria	.60@.65		
Annapolis	.65		
Baltimore	.58§		
Bangor	1.05*	1.15	1.10
Bath, Me	1.05*	1.15	.85*
Beverly	1.05*		.85*
Boston, Mass	1.05*	1.15	.85*
Bridgeport, Conn.		1.15	.65
Brooklyn		1.00	.18§
Cambridge, Mass.	1.05*		.85*
Cambridgeport	1.05*		.85*
Charleston, S. C.	.85	.85@1.00	
Charlestown	1.05*		.85*
Chelsea	1.05*		.85*
Com. Pt., Mass.	1.05*		.85*
E. Boston	1.05*		.85*
East Cambridge	1.05*		.85*
E.Gr'nwich, R. I.			.80
Fall River	.90*	1.00	.80
Galveston		3.00	
Gardner	1.05*¶	1.15	
Georgetown, D. C.	.65		
Gloucester	1.05*		
Hoboken	.95		
Jersey City			
Lynn	1.05@1.15*		1.35
Marblehead	1.05*		
Milton		1.30	
Newark		1.15***	
New Bedford	.90*	1.00	.80
New-Berne	.75		
Newburyport	1.20*	1.30	1.00*
New Haven		1.00	.65
New London		1.00	.75
New Orleans	2.00		
New York		1.00	.25§
Newark, N. J.		1.15	
Newport	.90*		.75§
Norfolk, Va.	.55		
Norwich		1.15*	.75@.80
Pawtucket			.75@.80
Portland, Me.	1.05*	1.00	.85*
Portsmouth, N. H.	1.15*	1.25	.95*
Portsmouth, Va.	.55		
Providence, R. I.	.90*	1.00	.75@.80
Quincy port			1.10
Richmond, Va.	.60@.65		
Rockport	1.25*		
Roxbury, Mass.	1.05*		
Saco	1.05*¶		
Salem, Mass.	1.05@1.15*	1.15	.85*
Savannah	.90@1.00	1.05	
Somerset		1.00	.75
Washington	.65		
Williamsb'g, N.Y.		1.00	
Wilmington, Del		1.00	
Wilmington, N.C.	.85	1.00	

* And discharging. † And discharging and towing. 3c. per bridge extra. § Alongside. ‖ And towing up and down. ¶ And towing. †† Pilotage. ** Below bridge. *** Old B. L.

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CONTRACTS OPEN.

64 OIL WELL DRILLERS—PROPOSALS will be received by "Editor," care of Engineering and Mining Journal, New York City, for boring for oil in France. Maximum depth 600 meters, through calcareous and bituminous shales. State price per meter, contractor finding all plant except engines.

92 ENGINES—PROPOSALS WILL BE received by Messrs. Kingsley Brothers, Hamilton, Loudon County, Va., for one large engine, 15 horse-power, engine and boiler, 20 horse-power automatic, also two or three engines, say 3 or 4 horse-power, and boilers from 4 to 6 horse-power.

94 RUBBLE STONE—PROPOSALS WILL be received by Major G. L. Gillespie, U. S Engineers, Post-Office Building, Boston, Mass., until October 12th, for 18,000 tons of rubble stone, delivered in Newburyport, Mass.

95 IRON-WORK PROPOSALS WILL BE received at the office of the Light-House Board, Washington, D. C., until October 4th, for furnishing the materials and labor of all kinds necessary for the completion and delivery on the site of the metal work of the Anclote Keys Light-House, Florida.

96 REMOVING ROCK—PROPOSALS WILL be received by O. M. Poe, Lieut.-Col. of Engineers, U. S. A., 34 Congress street, West Detroit, Mich., until October 7th, for removing solid rock and boulders from the channel of Detroit River at the locality known as Lime-Kiln Crossing.

97 FILTERS—PROPOSALS WILL BE RE-ceived at the office of the City Clerk, Cheyenne, Wyoming, until October 8th, for a system or process of filtration adapted to the purification of the water-supply for a plant supplying 1,000,000 gallons, and for one supplying 1,500,000 gallons, in twenty-four hours.

98 PUMPING ENGINES—PROPOSALS will be received at the office of the Water-Works, Cleveland, Ohio, until October 16th, for erecting two pumping engines, each capable of pumping fifteen million United States standard gallons of water in twenty four hours, against a maximum pressure of 100 pounds per square inch on the pumps.

100 STEEL GUN-FORGINGS AND ARMOR—Proposals will be received by the Secretary of the Navy, Navy Department, Washington, D. C., until December 10th, for about 1310 tons of steel gun-forgings, and about 4500 tons of steel armor plates.

101 MACHINERY FOR CRUISERS AND gunboats—Proposals will be received by the Secretary of the Navy, Navy Department, Washington, D. C., until November 24th, for the construction and erection on board the vessels of engines, boilers, and appurtenances, complete in all respects.

102 MARBLE AND SLATE TILES—PROposals will be received at the Office of Building for State, War, and Navy Departments, Washington, D. C., until October 9th, for furnishing marble and slate tiles and borders required in the west and center wings of the building for State, War, and Navy Departments in Washington.

103 PIPE COVERING—PROPOSALS WILL be received at the Office of Building for State, War, and Navy Departments, Washington, D. C., until October 4th, for furnishing, delivering, and applying hair-felt covering for hot-water and steam pipes in the west and center wings of the building for State, War, and Navy Departments at Washington.

104 STEAM-HEATING APPARATUS—PROposals will be received at the office of Supervising Architect, Treasury Department, Washington, D. C., until October 20th, for supplying and putting in place complete in the Custom-House, etc., at Toledo, Ohio, a low-temperature return-circulation steam-heating apparatus

105 RUBBLE STONE—PROPOSALS WILL be received by Major M. B. Adams, U. S Engineers, Burlington, Vt., until October 15th, for 16 665 cubic yards of rubble stone and 5500 cubic yards of large stone for Rouse's Point, N. Y.

106 SUPPLIES—PROPOSALS WILL BE RE-ceived by T. G. Baylor, Colonel of Ordnance, Commanding, Rock Island Arsenal Rock Island, Ill., until October 16th, for furnishing supplies during the fiscal year ended June 30th. Silver, gold, steel, tin, brass, iron, copper, etc.

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